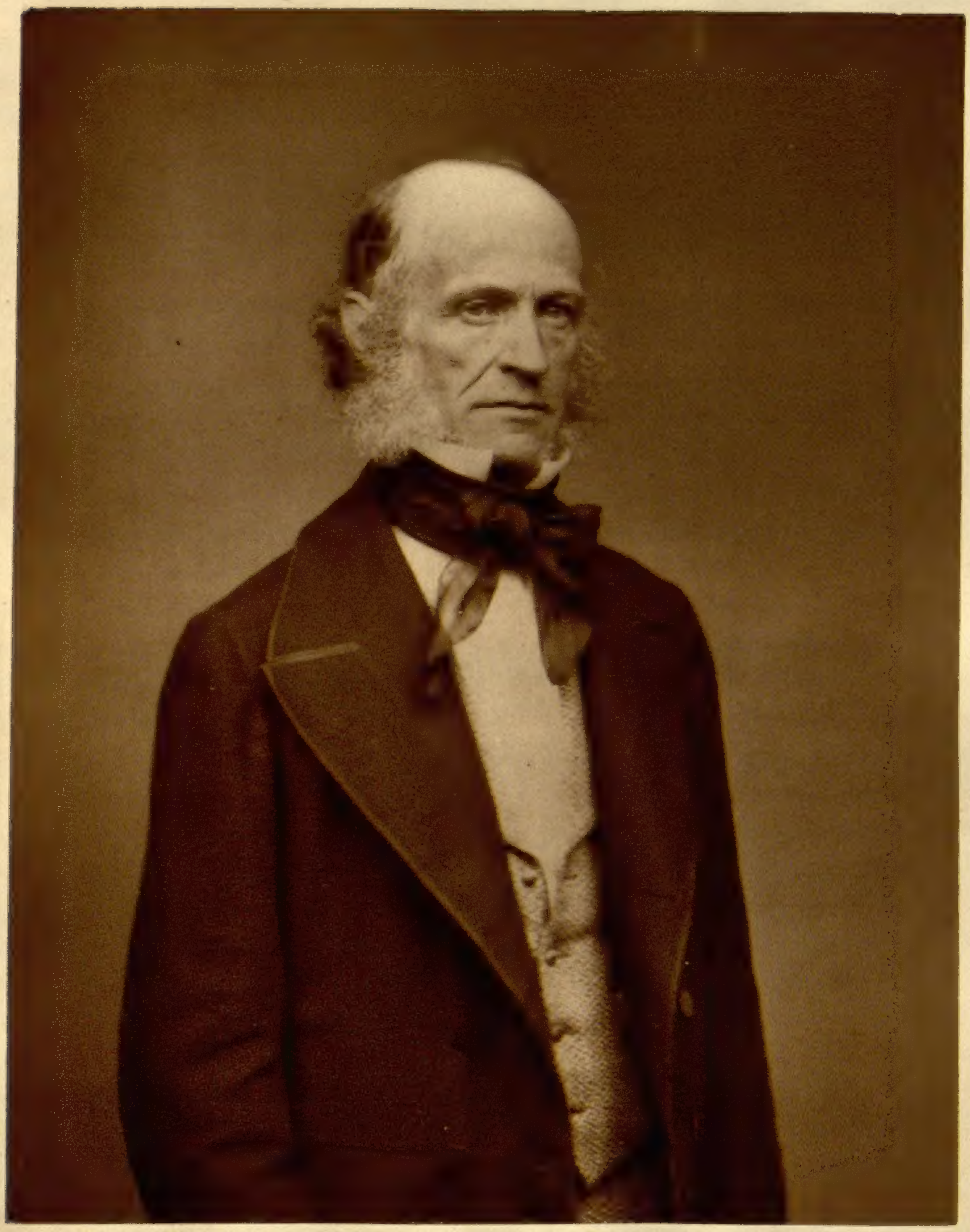


Yours very truly
Hewett C. Watson

QK1
.J5952

TRIMEN'S

JOURNAL OF BOTANY

BRITISH AND FOREIGN.

Edited by

JAMES BRITTEN, F.L.S.,

BRITISH MUSEUM (NATURAL HISTORY), SOUTH KENSINGTON.

NEW SERIES, VOL. X.

(VOL. XIX. OF THE ENTIRE WORK.)

ILLUSTRATED WITH PLATES.

MISSOURI
BOTANICAL
GARDEN.

LONDON:

WEST, NEWMAN & CO., 54, HATTON GARDEN.

—

1881.

LONDON:

WEST, NEWMAN AND CO., PRINTERS,

54, HATTON GARDEN, E.C.

Contributors to the 'Journal of Botany,' New Series.

Rev. F. Addison.
Rev. T. Allin.
W. Archer, F.R.S.
Prof. F. W. C. Areschoug.
Prof. P. Ascherson.
Prof. C. C. Babington, F.R.S., F.L.S.
J. Bagnall.
C. Bailey.
J. G. Baker, F.R.S., F.L.S.
Mrs. Baker.
J. Ball, F.R.S., F.L.S.
I. B. Balfour, Sc. D., F.L.S.
J. H. Balfour, M.D., F.R.S.
R. M. Barrington.
M. J. Barrington Ward, M.A., F.L.S.
W. E. Beckwith.
W. H. Beeby.
A. Bennett, F.L.S.
A. W. Bennett, M.A., B.Sc., F.L.S.
G. Bennett, M.D., F.R.S.
G. Bentham, F.R.S., F.L.S.
S. Berggren.
Rev. M. J. Berkeley, F.L.S.
T. B. Blow.
H. Boswell.
J. T. I. Boswell, F.L.S.
R. Braithwaite, M.D., F.L.S.
A. Brotherston.
N. E. Brown, A.L.S.
G. S. Boulger, F.L.S.
Mrs. Bramwell.
D. Brandis, M.D., F.L.S.
T. R. Archer Briggs, F.L.S.
J. Britten, F.L.S.
H. Bromwich.
R. Brown (Liverpool)
H. G. Bull, M.D.
†M. M. Bull, M.D.
W. Carruthers, F.R.S., F.L.S.
Prof. T. Caruel.
Prof. R. Caspary.
Prof. A. H. Church.
A. Christ, Ph.D.
A. Craig-Christie, F.L.S.
C. B. Clarke, M.A., F.L.S.
J. W. Clark.
H. Cleghorn, M.D., F.L.S.
J. Collins.
T. Comber.
M. C. Cooke, A.L.S.
E. J. Cox.
Prof. F. Crpéin.
Rev. J. M. Crombie, M.A., F.L.S.
J. Cunnack.
†F. Currey, F.R.S., F.L.S.
N. A. Dalzell.
Alph. DeCandolle.
A. Déséglise.
Prof. G. Dickie, M.D., F.L.S.
Prof. A. Dickson, M.D., F.L.S.
G. C. Druce, F.L.S.
J. F. Duthie, B.A., F.L.S.
W. T. Thiselton Dyer, M.A., B.Sc., F.L.S.
Rev. A. E. Eaton, M.A.
Mrs. Edwards.
Prof. A. W. Eichler.
A. Ernst, Ph.D.
Prof. W. G. Farlow, M.D.
W. Fawcett, B.Sc., F.L.S.
H. C. Field.
W. Flight, D.Sc.
T. B. Flower, F.L.S.
W. O. Focke.
H. O. Forbes.
E. Fournier.
A. Franchet.
Rev. J. Fraser.
†A. French.
†Prof. E. Fries.
H. G. Glasspoole.
Prof. A. Gray, M.D.
†J. E. Gray, Ph.D., F.L.S.
L. H. Grindon.
H. Groves.
J. Groves.
†D. Hanbury, F.R.S., F.L.S.
F. J. Hanbury, F.L.S.
H. F. Hance, Ph.D., F.L.S.
H. C. Hart, B.A.
W. E. Hart.
M. M. Hartog, M.A., B.Sc., F.L.S.
†W. A. Hayne.
W. B. Hemsley, A.L.S.
W. P. Hiern, M.A., F.L.S.
Rev. W. M. Hind, LL.D.
C. P. Hobkirk, F.L.S.
†Miss E. Hodgson.

R. Holland.
E. M. Holmes, F.L.S.
Sir J. D. Hooker, K.C.S.I., M.D., F.R.S., F.L.S.
T. Howse, F.L.S.
Rev. R. Hunter.
J. Hussey.
†A. Irvine.
B. D. Jackson, F.L.S.
J. R. Jackson, A.L.S.
G. S. Jenman.
J. H. Jenner.
Rev. W. Johnson.
H. Halcro Johnston, M.D.
Bolton King.
F. E. Kitchener, F.L.S.
†S. Kurz.
Rev. J. E. Leefe, F.L.S.
E. Lees, F.L.S.
F. A. Lees, F.L.S.
Rev. W. A. Leighton, B.A., F.L.S.
L. Leresche.
E. Levier, M.D.
Prof. S. O. Lindberg, M.D.
A. Lister, F.L.S.
Mrs. Lomax.
C. Longfield.
A. N. Lundström.
Prof. W. R. McNab, M.D., F.L.S.
J. C. Mansel-Pleydell, F.L.S.
M. T. Masters, M.D., F.R.S. F.L.S.
W. Mathews, M.A.
J. C. Melvill, M.A., F.L.S.
H. T. Mennell, F.L.S.
Mrs. Merrifield.
†J. Miers, F.R.S., F.L.S.
W. Mitten, A.L.S.
†D. Moore, Ph.D., F.L.S.
S. le M. Moore, F.L.S.
T. Moore, F.L.S.
A. G. More, F.L.S.
Prof. J. Morris.
Baron F. von Mueller, Ph.D., F.R.S., F.L.S.
C. J. Muller.
J. Muller (Arg.)
†General W. Munro, C.B., F.L.S.
G. R. M. Murray, F.L.S.
A. Nathorst.
F. Naylor.
G. Nicholson.
Prof. D. Oliver, F.R.S., F.L.S.
†Rev. E. O'Meara, M.A.
D. Orr.
Rev. W. H. Painter.
W. H. Pearson.
C. H. Peck.
W. Phillips, F.L.S.
C. B. Plowright.
H. Polakowsky.
J. Pollard.
C. Prentice.
H. Prestoe.
Rev. T. A. Preston, F.L.S.
†R. A. Pryor, B.A., F.L.S.
Rev. W. H. Purchas.
Rev. H. P. Reader, B.A.
W. W. Reeves.
H. Reeks, F.L.S.
Prof. H. G. Reichenbach.
J. Renny, F.L.S.
†W. Richardson.
H. N. Ridley, B.A., F.L.S.
J. F. Robinson.
W. D. Roebuck.
Rev. W. Moyle Rogers, M.A.
F. C. S. Roper, F.L.S.
J. Sadler.
†J. Scott, F.L.S.
J. C. Shenstone.
W. G. Smith, F.L.S.
H. C. Sorby, F.R.S.
R. Spruce, Ph.D.
G. Stabler.
F. Stratton, F.L.S.
Rev. G. S. Streatfield, M.A.
R. F. Towndrow.
F. Townsend, M.A., F.L.S.
Prof. J. W. H. Traill, M.D., F.L.S.
†Sir W. C. Trevelyan, Bart.
H. Trimen, M.B., F.L.S.
R. Trimen, F.L.S.
R. Tucker, M.A.
E. G. Varenne.
S. H. Vines, M.A., F.L.S.
T. Walker.
A. R. Wallace, F.L.S.
H. Marshall Ward.
F. I. Warner, F.L.S.
Hon. J. L. Warren, M.A.
D. A. Watt.
†F. M. Webb.
†Rev. R. H. Webb, M.A.
†F. Welwitsch, M.D., F.L.S.
West, W.
†E. C. White.
J. W. White.
F. Buchanan White, M.D., F.L.S.
J. Willis, Ph.D.
W. Wise.
Rev. R. Wood, M.A.

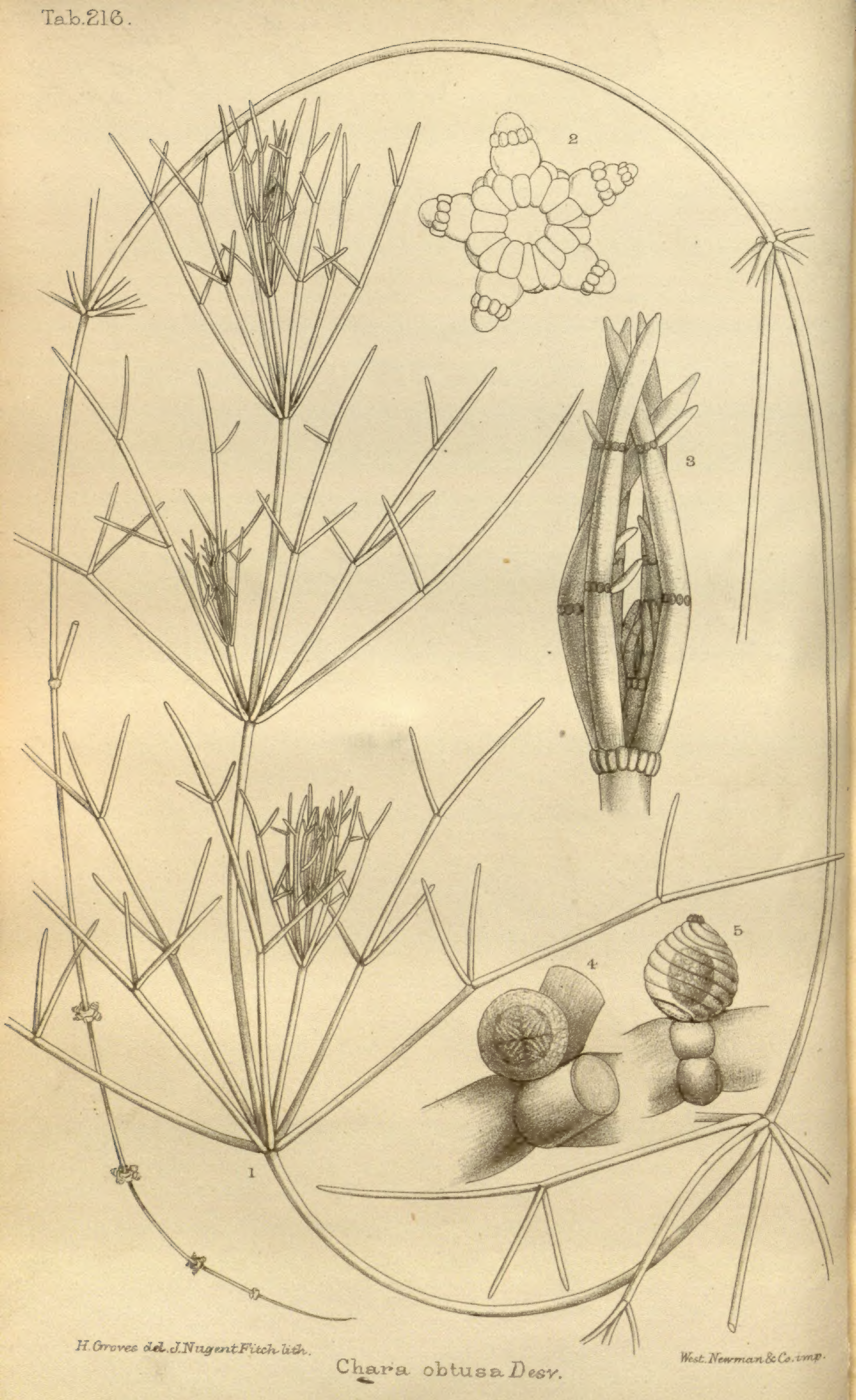
Dixections for placing the Plates.

Tab. 216	to face page	1
„ 217	„	65
„ 218	„	97
„ 219 and 220	„	129
„ 221	„	193
„ 222 and 223	„	321
„ 224	„	353

Mr. Watson's portrait to face title-page.

WEST, NEWMAN AND CO., PRINTERS, 54, HATTON GARDEN, LONDON, E.C.

Tab.216.



H. Groves del. J. Nugent Fitch lith.

West, Newman & Co. imp.

Chara obtusa Desv.

TRIMEN'S
JOURNAL OF BOTANY
BRITISH AND FOREIGN.

Original Articles.

ON *CHARA OBTUSA*, Desv., A SPECIES NEW TO BRITAIN.

By Henry and James Groves.

(Tab. 216.)

As may be seen by the number of this Journal for October, 1880, Mr. Arthur Bennett's careful investigation of the Flora of our eastern counties has been rewarded by the discovery of *Chara obtusa* in Filby Broad, near Yarmouth, East Norfolk. This species not having been previously found in Britain, a description and plate are now given :—

Chara obtusa, Desv. in Loiseleurs, Notice sur les plantes à ajouter à la Flore de France (1810), p. 136.

C. vulgaris var. *elongata*, Wallr., Ann. Bot. (1815), p. 182.

C. ulvoides, Bertoloni in Bruni, Nuov. collez. d'opusc. Scient. 1825, p. 113; Flora Italica, vol. x., p. 21. Amici, Descriz di alcune sp. nuove di Chara (1827), p. 21, t. iv., f. 7—9. Ganterer, Oesterr. Charen (1847), p. 11, t. i., f. 5.

C. stelligera, Bauer in Moessler's Handb. der Gewachsk., ed. 2 (1829), vol. iii., p. 1595 (fide Wallroth and Ruprecht). Braun, Ann. Sc. Nat. 1834, p. 352; Flora 1835, vol. i., p. 55; Cohn's Krypt. Flor. von Schlesien (1877), p. 402. Ruprecht, Symb. ad Hist. pl. Ross. (1845), p. 77. Ganterer, Oesterr. Charen (1847), p. 11, t. i., f. 4. Leonhardi, Oesterr. Armleuchter Gewachse (1864), p. 58. Braun, R. & S. Exs. 1 & 34. Nordst. & Wahlst. Exs. 49 a. b.

C. translucens (and var. *stelligera*), Reich., Iconog., t. 804–5, and comm. ix., p. 2 (not of Persoon).

N. ulvoides, Kuetz., Phyc. Gen. (1843), p. 318. Wallm. Act. Acad. Stockh., 1852 (1854), p. 268.

N. *stelligera*, Kuetz., Phyc. Gen. (1843), p. 318; Sp. Alg. (1849), p. 518; Tab. Phyc. vii., p. 118, t.27, f. 1. Coss. & Germ., Flor. Par. (1845), p. 681, and Atl. t. 41, f. G. Wallm., *l. c.*, p. 267.

N. Bertolonii, Kuetz., Tab. Phyc. vii., p. 11, and t. 26, f. 2.

Stem stout, moderately branched, *without cortical cells*, producing at the lower nodes, white stellate processes (modified whorls).

Whorls of 5–6 (rarely 7), straight or slightly recurved branchlets. Stipulodes* in a single circle, *rudimentary*. Branchlets very long, acute, of 2–3 segments. Developed bract cells 1–3 very long, patent, somewhat acute. Nucules subglobose 9–striate. Coronula minute, conical, persistent. Globules solitary, or two together. Diœcious.

This is one of the largest species of the order, having branchlets sometimes over six inches, and bract cells two inches and a half in length. It is of a bluish green, usually considerably incrusted and very brittle. It may be immediately distinguished from the rest of the British species of the genus by the absence of cortical cells. The most remarkable characteristic is the great tendency to accumulate large starch granules in all the nodal cells, as well as in the peculiar abbreviated branchlets of the lower (underground) whorls, which form beautiful white starlike structures. The branchlets of these lower whorls have usually one node, but rarely, as in one of the branchlets of the large specimen from which our magnified representation is taken, two are produced. It is usual among Charas for a correlation to exist between the stipulodes and bract cells, but in *C. obtusa* the former are rudimentary, while the latter are very long. The nucules resemble those of the *Nitelleæ* in the very thick spiral cells, and in the small size and shortness of the nucleus and coronula, which last, however, is composed of only five cells, and is decidedly persistent. The female plant has rarely been found, the reproduction usually taking place from the nodes which are capable of separate existence and survive the winter. Mr. Bennett's specimens are, however, of both sexes.

The position of *C. obtusa* in the order has always been doubtful, and the extent of its relationship to the *Nitelleæ* is not yet clearly made out. It was taken by Reichenbach to be a form of *N. translucens;* in Braun's earlier works it is placed between the Nitellas and Tolypellas, but he subsequently removed it to the true Charas, constructing for it a section which he called *Astephanæ;* Wallman placed it with Tolypella in his section *Pseudobracteatæ;* Leonhardi included it among the Charas, constituting for it the section *Tolypellopsis*.

Braun adopted the German name of *Chara stelligera*, passing over the two earlier names, *C. obtusa* and *C. ulvoides*, the former on the ground of its being inappropriate, the latter as referring only to a stout form of *C. stelligera*. Now, although the name *obtusa* is not so appropriate for the plant as *stelligera*, the rejection of it on that account is altogether impossible, as the acceptance of this principle would lead to the instability of every name, for who can tell that a better name than *stelligera* may not be found, and this in its turn superseded? With regard to the name of *C. ulvoides*, Bert., it seems unreasonable to assume that this could refer merely to a form of the species described some years later. It is much to be regretted that this is only one of many instances in

* By an oversight we omitted to state, in our "Review of the British *Characeæ*," that we are indebted to Mr. Alfred W. Bennett for this term as applied to the cells surrounding the base of the whorls in the *Chareæ*.

which the names used by Braun must be set aside, especially as from his great knowledge of the plants of this order, his nomenclature has usually been adopted without question. The original description of *C. ulvoides* was contained in a letter from Bertoloni to Prof. Amici, dated 24th March, 1826, which was published in Bruni's Nuova Collez. for 1825; thus the exact date of publication is uncertain. We have been unable to see the original description of *C. stelligera*, as we cannot find a copy of Moessler's 'Handbuch,' ed. ii., at the libraries of the British Museum, Kew Herbarium, or of the Royal or Linnean Societies.

C. obtusa is widely distributed in Europe, but is not known to occur elsewhere; it has been found in Sweden, Germany, Belgium, France, Italy, Austria, and South Russia occurring in lakes, canals, &c. The nucules ripen about August. The Norfolk plant is a large form; although not so stout as the Mantuan specimens, it has the longest branchlets of any that we have seen.

DESCRIPTION OF TAB. 216.—1. *Chara obtusa*, Desv., nat. size. 2. Stellate lower node, from below. 3. Upper part of a slender branch, showing developed and undeveloped bract cells and rudimentary stipulodes. 4. A globule. 5. A nucule.

THE HISTORY OF THE SCORPIOID CYME.

BY SYDNEY H. VINES, D.Sc., F.L.S.

IN a recent number of the 'Transactions of the Linnæan Society of London,' the Rev. George Henslow publishes some conclusions respecting the nature of the inflorescences usually termed scorpioid cymes by a study of their phyllotaxis. These conclusions are important, inasmuch as they assert that all scorpioid cymes are not formed in the same way, some being sympodia and others monopodia, and further inasmuch as they suggest that the term "scorpioid" is frequently used inaccurately in descriptive Botany. It will be at once seen that the questions at issue are by no means trivial, and I venture to think that a full discussion of them is called for. This I propose to give in the following pages as briefly as the extensive literature on the subject will allow.

In order thoroughly to understand what is meant by a "scorpioid cyme," it will be necessary to ascertain the particular forms of inflorescences to which it has been applied by various authors, and carefully to note any differences which may occur in their definitions of the term. The term appears to have been invented by A. P. DeCandolle, and he defines it, in his 'Organographie Végétale,' tome i., 1827, p. 414, as follows:—"Une seconde différence assez remarquable qu'on observe dans les cimes, et surtout sur les cimes dichotomes, c'est que sur les deux rameaux qui doivent se développer à l'aisselle des deux bractées, il y en a quelquefois un qui avorte, et alors la fleur terminale semble latérale. . . . Dans ce cas, les fleurs sont généralement disposées d'un seul côté, soit par une tendance des rameaux à avorter du même côté, soit par une torsion de l'axe. Les branches ou tiges

dans lesquelles cette disposition a lieu, sont, en général, avant leur développement, roulées en volute du côté extérieur ; c'est ce qu'on observe dans les Drosera, dont les cimes ont les fleurs unilatérales, dans les Silenés dits en épi, dans les branches des cimes des Sedum, dans celles des Echium, et autres Borraginées. Je donne à ces cimes, dont les fleurs semblent unilatérales, le nom de *cimes scorpioides*, qui fait allusion à leur mode de développement."

The next important work on the subject appears to be that of Karl Schimper. He distinguishes two forms of unilateral cymes. A report of the lecture delivered at Stuttgart, in which he stated his views on this subject, is contained in the 'Flora' for 1835: from page 189 I literally translate the following passage:—"If only one of the two branches (of a dichasium) be developed, two different types of unilateral branching arise, accordingly as the developed branch is the homodromous or the antidromous one. When the homodromous branch is developed, the branching is always continued towards the same side, it assumes a screw-like form, and has therefore been termed a *Schraubel* (Bostryx): when the antidromous branch is developed, a system of alternating branches is produced, a *Wickel* (Cicinnus), to which the inflorescence belongs, which is known as the *cyma scorpioides*." The lecture was illustrated by a sheet of diagrams of the different forms of branching, which was distributed to the audience. Unfortunately I have not been able to find a copy of this sheet (known as *das Schimpersche Täfelchen*), but there is reason to believe that the figures given below (copied from Hofmeister) are due to Schimper. The examples which he gives are the following: of the Cicinnus, *Alsine media*, *Helleborus fœtidus*, *Tribulus*, *Aizoon;* of the Bostryx, *Nerium*, *Hypericum*.

In 1837 the brothers Bravais published in the 'Annales des Sciences Naturelles' an essay on the symmetry of inflorescences, from which it appears that they had independently arrived at a distinction of two kinds of unilateral cymes just as Schimper had, but their terminology is different. Their definitions are as follows:—

"Cime hélicoide : cime où les fleurs successives sont rangées en spirale autour du pseudothalle :

"Cime scorpioide : cime où les fleurs sont rangées suivant deux séries parallèles à l'axe du pseudothalle."

And they further distinguish the helicoid and scorpioid cymes of Dicotyledons from those of Monocotyledons. It is not easy to identify the forms distinguished by Schimper with those distinguished by Bravais, inasmuch as they appear to have studied different plants. We shall see, however, that such an identification has been made.

Payer follows Bravais in his distinction of two forms of unilateral cymes: thus, on page 98 of his 'Eléments de Botanique' (1857), he writes—" . . . la cyme unipare peut être définie ; une inflorescence composée d'une série d'axes floraux placés les uns au bout des autres." On page 99 he continues—"La *cyme unipare hélicoide* peut donc être définie ; une inflorescence dans laquelle toutes les fleurs sont de génération différente, oppositifoliées, et

disposées en hélice :" and again, on page 100, "La *cyme unipare scorpioide* peut donc être définie ; une inflorescence dont toutes les fleurs sont de génération differente, et rangées sur deux séries seulement." As an example of the helicoid cyme he mentions *Alstræmeria versicolor ;* and as examples of the scorpioid cyme he gives *Sedum album*, *Hyoscyamus niger ;* and he adds on page 113, "l'inflorescence des Myosotis."

It is curious that the next French book of importance, namely, Le Maout and Decaisne's 'Traité Générale' (1868), should ignore Bravais, and describe, as DeCandolle did, only one form of unilateral cyme, using the expression "cyme scorpioide." They apply this expression to the inflorescence of Myosotis, and to a diagram which precisely corresponds to the one given below, which Hofmeister, following Schimper, calls a helicoid cyme.

The most recent French text-book of Botany, namely, Duchartre's 'Eléments de Botanique' (1877), gives the following account of the unilateral cymes, from which it will be seen that he has reconciled the terminology of Bravais with that of Schimper :—

"La cyme unipare scorpioide (Cicinnus, Wickel de Schimper). Ses caracterès essentiels consistent.

"1. En ce que son rachis n'est pas un axe unique, mais le résultat de la superposition d'un grand nombre de petits axes nes les uns des autres, par conséquent subordonnés les uns aux autres, et dont l'ensemble forme des lors un sympode.

"2. Que ses fleurs sont placées sur ce rachis du côté opposé à celui qu' occupent tout autant de bractées, qui, à la vérité, peuvent manquer, comme on le voit par la cyme scorpioide que représente la figure 240. (Fig. 240. Cyme scorpioide du *Symphytum asperrimum*.)

"3. Que ces mêmes fleurs sont rangées en deux files longitudinales parallèles sur un côté de cet axe commun."

"La cyme unipare hélicoide (Bostryx, Schraubel de Schimper) appartient surtout à des Monocotyledones, Hemerocallis, Alstræmeria, Phormium, Ornithogalum. Elle ressemble à la précédente en ce que son rachis est un sympode et que chaque fleur est opposée à une bractée ; mais elle en diffère essentiellement en ce que ses fleurs et ses bractées, au lieu d'être situées respectivement les unes et les autres d'un même côté du rachis, tournent autour de celui-ci en spirale ou hélice, particularité qui lui a valu son nom. Cette différence capitale tient à ce que si, dans une cyme scorpioide, les fleurs sont placées alternativement l'une à droite et l'autre à gauche par rapport à la précédente par ordre d'âge et deposition, dans une cyme hélicoide elles se trouvent toutes du même côté par rapport à cette précédente, toutes à droite dans certaines plantes, toutes à gauche dans d'autres ; il y a donc homodromie dans la cyme hélicoide."

But to resume the chronological order. Hofmeister, in his 'Allgemeine Morphologie,' 1868, p. 435, identifies the terminology of Schimper and of Bravais just as Duchartre does. The following is a literal translation of what he says on the subject :—"Experience shows that the solitary lateral branch always stands on the

one side, either the right or the left, of the median plane of the branch of a lower order which bears it. In this case the successive branches, provided that they are directed obliquely upwards, describe a screw-line; when placed in a horizontal position, or if projected upon a plane perpendicular to the long axis of the branch of the first order in the system, this line is a spiral. Such a branch system is a *Schraubel* or *Bostryx* (Schimper), a *cyme unipare helicoide* (Bravais), (fig. 1). This case occurs less frequently than the one

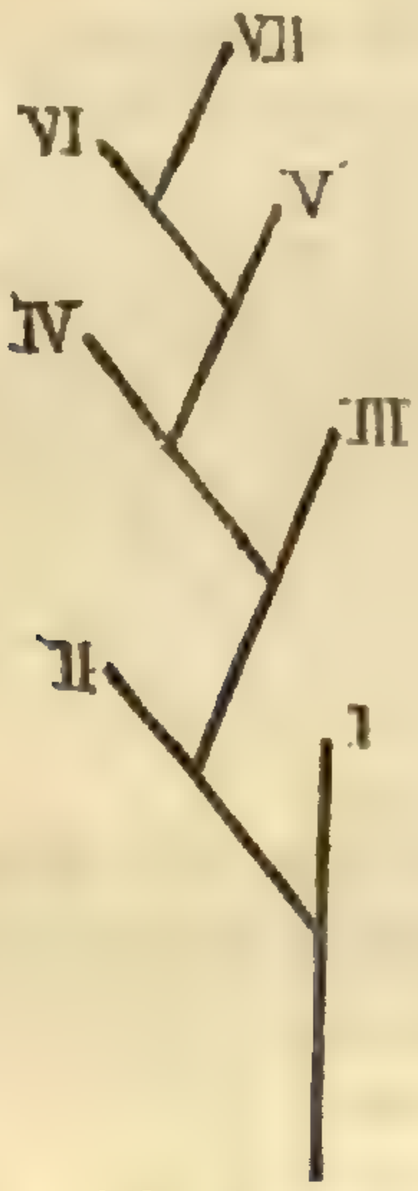


Fig. 1.

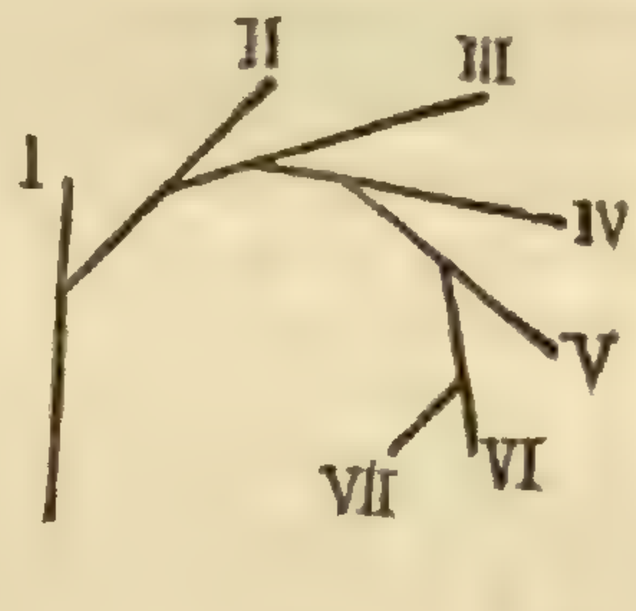


Fig. 2.

in which the position of the lateral branch to the branch which bears it varies at each branching; it does so in such a way that, for instance, the lateral branch of the second order is borne on the right side of the branch of the first order, then the branch of the third order is borne on the left side of the branch of the first order, and then the branch of the fourth order is again to the right of the median plane of the branch of the third order, and so on. Such a branch system, if projected upon a plane which passes transversely through the branch of the first order, forms a zigzag line (fig. 2). In inflorescences . . . it is rolled-up in a plane which is more or less nearly vertical. For this reason this form of branching has received the name of *Wickel* or *Cicinnus* (Schimper), and of *cyme unipare scorpioide* (Bravais)." Examples, of the Bostryx, *Hemerocallis fulva* and *flava*, and the individual inflorescences of *Hypericum perforatum*; of the Cicinnus, the inflorescences of the Boraginaceæ, of the various species of Helianthemum, of Drosera, and of Tradescantia.

Sachs, in the most recent edition of his 'Lehrbuch' (1874, p. 574), defines helicoid and scorpioid cymes just as Hofmeister does, and he also mentions the same examples.

Eichler, in Vol. I. of his 'Blüthendiagramme' (1875, p. 34), defines these cymes as follows:—

"*Schraubel* (*cime unipare helicoïde*, Bravais); Seitenaxen in den successiven Generationen immer auf relativ die nämliche Seite der

relativen Abstammungsaxe fallend : *Wickel* (*cime unipare scorpioïde*, Bravais) ; Seitenaxen abwechselnd auf entgegengesetzte Seiten der relativen Abstammungsaxe fallend."

From the preceding quotations it appears that the term "scorpioid" has been used in two distinct senses by continental authors, by DeCandolle and by Le Maout and Decaisne it is applied indifferently to all unilateral cymes, by all the other authors it is applied to a particular form of unilateral cyme.

We will now proceed to enquire as to the sense in which this term has been used in England. In the English edition of the 'Traité Générale' the words of Le Maout and Decaisne are literally reproduced, and the term "scorpioid" is evidently used in the general sense given to it by the French authors. In Prof. Bentley's 'Manual of Botany' (3rd edition, 1873), on page 200, the words "helicoid" and "scorpioid are used synonymously, and a diagram of a unilateral cyme is given which exactly resembles that given above, No. 1. These terms are applied indifferently to all unilateral cymes. In Prof. Balfour's 'Manual' (5th edition, 1875), the following account of unilateral cymes is given on page 185 :—

"The uniparous cyme presents two forms, the *scorpioid* and the *helicoid*. In the scorpioid the flowers are arranged alternately in a double row along one side of the false axis, the bracts, when developed, forming a double row on the opposite side, as seen in the Henbane ; the whole inflorescence usually curves on itself like a scorpion's tail—hence its name. In fig. 273 (fig. 273 is a diagram exactly resembling No. 1 above) we have a diagrammatic sketch of this arrangement. The false axis . . . is formed by successive generations of unifloral axes, the flowers being arranged along one side alternately, and in a double row ; the whole inflorescence is represented as curved on itself. In fig. 274 (inflorescence of Forget-me-not) the same scorpioid form of uniparous cyme is seen, with the double row of flowers on one side of the false axis, but in this case the bracts, which should appear on the opposite side, are not developed, and hence the cyme is not complete."

"In the helicoid cyme there is also a false axis formed by the basal portion of the separate axes, but the flowers are not placed in a double row, and form a spiral or helix round the false axis." After briefly describing the inflorescence of Alstrœmeria, the author adds: "In this case the axes are arranged, not in two rows along one side of a false axis, but are placed at regular intervals, so as to form an elongated spiral round it."

Dr. Masters, in the last edition of Henfrey's 'Elementary Course,' page 83, describes these inflorescences as follows, a figure of the scorpioid cyme being given which is similar to our figure 1 :—

"The subsidiary flower-stalks are sometimes developed all on the same side, when the inflorescence becomes curled from the greater growth on one side than on the other. Such cymes are called *scorpioid cymes*. At other times the subsidiary pedicels or flower-stalks are developed alternately, first on one side and then on the other, when the inflorescence has a zigzag shape. When the

main rachis is a sympode, and the flowers, instead of being all on one or on two opposite sides, are disposed spirally, the term *helicoid cyme* is given."

It appears that the term "scorpioid" is used in two senses by English authors also. Sir Joseph Hooker and Prof. Bentley use it, as DeCandolle did, in a general sense. Prof. Balfour's definition of it is the more restricted one which is given by modern continental authors, whereas Dr. Masters seems to include in his definition both the forms represented by our figures 1 and 2. But it also appears that Prof. Balfour and Dr. Masters apply the term "scorpioid" to a diagram (fig. 1) which continental authors describe as "helicoid." The editor of the English edition of Sachs' 'Lehrbuch' directs attention to the difficulty which thus arises; I did the same in the preface to the English edition of Prantl's elementary work; and this difficulty appears also to have occurred to Mr. Henslow. In a review of the English edition of Prantl ('Nature,' July 8, 1880), the reviewer also notices it, and criticises Sachs and Prantl for having omitted to mention respecting their figures of helicoid and scorpioid branching (which resemble those given above) that a *plan* is given, and not an *elevation*, as is done in English text-books. It is by no means certain, however, that these authors really meant this. The figures in question are merely amplified reproductions of those of Hofmeister given above, and his account of the mode in which they were taken is also given. It is not easy to decide whether or not this account will bear interpreting in the sense in which the reviewer of Prantl takes them, but his suggestion has at least the merit of affording a means of avoiding what would be a striking case of contradiction in the use of terms. In all text-books, whether English or foreign, it will be advisable for the future that the authors should state distinctly which view of these branch systems their figures represent.

So much for the mere terminology of the subject. The question now arises, does the description of the formation of the scorpioid cyme which is generally accepted, as the foregoing quotations show, really correspond with observed facts, or is it merely a convenient fiction? Does the axis of the inflorescence really consist of a number of parts, each of which belongs to a separate branch? Is the axis really a sympodium or pseud-axis as it is said to be? Some doubt as to the sympodial nature of the axis appears to have existed so far back as the date of the appearance of Schleiden's 'Grundzüge der wissenschaftlichen Botanik,' for he there says, in his characteristically vigorous way (I quote from the English translation, p. 308): "DeCandolle has further applied the term cyme to the inflorescence of the Boraginaceæ, which, on account of the peculiar manner in which it unrolls itself, he terms *cyma scorpioides*; and he adds the fiction that the undermost, first-blooming flower, is really the terminal blossom, and the second, the terminal blossom of the side axis, is developed in a disproportionate degree, and so on. From the rolling-up there is just as little to be deduced as from the same phenomenon in the leaves of Ficus and Cycadaceæ. The position of the bracts, as seen in Cerinthe, contradicts

this fiction; and the history of development, which can alone determine the point, appears to me to prove (I own from a few very imperfect observations) that here a one-sided raceme or spike is present, whose unrolling is only a peculiar situation of the buds."

From a study of their phyllotaxis, Mr. Henslow has come to the conclusion, which is stated in the paper mentioned above, that some at least of the scorpioid cymes (*e. g.*, Hyoscyamus) are not sympodia, but monopodia. Interesting and ingenious though this method of investigation may be, it is too theoretical to afford perfectly conclusive results, and, moreover, it cannot be applied in all cases. The only way to decide questions of this kind is, as Schleiden urged, to ascertain what actually takes place when the inflorescence is being formed, to study carefully its development. This has been done by several botanists with the following results:— Kaufmann concludes that the inflorescence of *Symphytum peregrinum*, of *Myosotis palustris*, of *Anchusa officinalis*, and others, is produced by repeated dichotomy of an axillary bud, and this conclusion was confirmed by Warming, by Pedersen, and by Kraus, in so far as bracteate scorpioid cymes are concerned; but naked cymes, such as those of Myosotis and of Heliotropium, are, according to Kraus, monopodia with a flattened growing-point which bears two rows of flower-rudiments on its dorsal surface. The more recent researches of Goebel (Arb. d. Bot. Inst. in Würzburg, Bd. ii., 1880), show not only that Kraus' account of the development of the inflorescence of Myosotis and Heliotropium is accurate, but that it applies also to that of *Symphytum officinale*, Anchusa, Cerinthe, Borago, Cynoglossum, *Echium vulgare*, *Lithospermum arvense*, and *Caryolopha sempervirens*. Goebel finds also that the development of the inflorescence of *Hyoscyamus niger* and of *Klugia Notoniana* is the same as that of the Boraginaceæ which he investigated. These facts go far to justify Schleiden's description of the scorpioid cyme as a "fiction." It is evident that these inflorescences are monopodia, and this being so, they must be termed not scorpioid cymes, but unilateral racemes. Mr. Henslow, in fact, suggests in his paper that the inflorescence of Hyoscyamus ought to be termed a "scorpioid raceme." The sympodial nature of any branch system must henceforth be regarded with suspicion until its development has been properly studied. It is only by this means that botanical science will become entirely free from the trammels of the "Naturphilosophie" which so long impeded the progress of research, and which were first loosened by the efforts of Schleiden.

ON *POTAMOGETON LANCEOLATUS* OF SMITH.

By C. C. Babington, F.R.S., &c.

This plant, which was until the present year only known to grow in one place, has long been what is called a "critical" species; for very few botanists have seen it in its native place or in a living state, and none have ever seen its fruit. Its recent discovery in

the Fen country has again especially directed attention to it. But before that discovery was known, it had been very recently gathered by Mr. J. E. Griffith, F.L.S., of Bangor, in the original locality. On his informing us of it, my friend Mr. A. G. More and I determined to go with him to the spot.

The station is not even now a very accessible one, and until recently it might be almost called inaccessible. The formation of the Anglesea Central Railway has removed much of the difficulty; for by it the little town of Llanerchymedd is easily reached, and then there is about three miles of rough country to traverse in order to arrive at Penrhos-lligwy, near which place the plant is found.

It was first recorded by Sir J. E. Smith, and named *P. lanceolatum* (Eng. Bot. t. 1985), and well figured by Mr. Sowerby from specimens sent to them in 1808 by the Rev. H. Davies. Mr. Davies gives the exact locality in his own 'Welsh Botanology' as "between Bodafon and Lligwy," in Anglesea. These are two gentlemen's seats, one a little above the bridge at Penrhos-lligwy, and the other some distance below it. Until the last summer this was the only known locality for it; all the others being undoubtedly mistakes. The late Mr. W. Wilson, the celebrated muscologist, gathered it in the small brook called the Lligwy, from which the parish takes its distinctive name, in July, 1826, finding it only in flower (Hook. Bot. Misc. ii. 140). Mr. William Christy gathered it there in 1832, and Mr. J. E. Bowman at about the same date. I know of no visit having been since made to the place until 1879, when Mr. J. E. Griffith found it there.* On August 31, 1880, he conducted Mr. A. G. More and myself to the place. We found plenty of the plant growing in the quieter parts of the rather rapid stream, both above and below the bridge of Penrhos-lligwy. In common with all preceding botanists, we found only flowers, and Mr. Griffith, who has been to the spot twice since, the second occasion being at the end of October, has not been more successful. He sent an abundance of fresh specimens to Mr. More and myself, but we have been unable to discover any trace of fruit; only, even on the October specimens, such immature flowers as Wilson found in July. This is a very remarkable fact, and even the more remarkable from no fruit having been found on the Cambridgeshire specimens discovered on August 4, 1880, by Mr. A. Bennett in Burwell Fen. So the fruit still remains quite unknown. If it had not been for Mr. Bennett's discovery, we might have thought that the plant of Anglesea was a barren form of some species, and that it propagated itself by offsets, since it roots freely from the joinings of the stem. But the discovery of exactly the same plant in the Fens renders this improbable. There can be no doubt of the two plants being absolutely identical, for several of our leading botanists have most carefully compared them, and found them to be the same in all respects.

At one time I thought that it might be *P. varifolius*, Thore, but am now convinced of my mistake; I have a specimen of

[* There are specimens in the British Museum Herbarium collected by Mr. F. M. Webb in the Lligwy in 1866.—Ed. Journ. Bot.]

Thore's plant, from "Uza, Depart. des Landes," gathered by Endress in 1831, which is quite different. Grenier placed it under *P. gramineus* (our *heterophyllus*), which is also wrong.

P. lanceolatus of Reichenbach (Fl. Germ. exsic. No. 2401) is *P. salicifolius*, Wolfg., *P. Lonchites*, Tuckerm., I believe. *P. panormitanus*, Biv., as represented by No. 188 of Huet du Pavillon's "Pl. Siculæ," is much like our plant, but has different stipules; and Parlatore says that that name is "puro sinonimo dei *P. pusillum*" (Fl. Ital. iii. 638). My specimen of *P. panormitanus* is from one of the stations named by Gussone. Gussone has described this plant in his 'Fl. Siculæ Synopsis,' i. 207.

I have very little to add to my description of *P. lanceolatus*. The upper floating leaves are opposite, and differ very little from the alternate submersed leaves. Their stalks are very short, and they have more of the chainlike network than the lower leaves. The lower stipules are almost subulate; the uppermost are much broader, with two strong dorsal elevated ribs. In other respects my description appears to be correct, but I have been very much disappointed by not being able to add an account of the fruit to it.

Fries joins our *P. lanceolatus* to his *P. nigrescens*, with the remark, "descriptio Wilsonii *P. lanceolati* (Sm.) in Hook. Brit. iv., p. 70, optime quadrat;" and certainly the descriptions in his Mantissa (iii. 17) and Summa (214) do agree very well with our *P. lanceolatus*. In his case the fruit is described as "fr. compressis siccitate carinatis." I have not seen a specimen or figure of *P. nigrescens*. It was published with that name in 1839; Smith's *P. lanceolatus* appeared in Eng. Bot. in 1809.

MUSCI PRÆTERITI:

SIVE DE MUSCIS NONNULLIS ADHUC NEGLECTIS, PRÆTERVISIS VEL CONFUSIS, NUNC RECOGNITIS.

AUCTORE RICARDO SPRUCE.

(Continued from p. 362.)

6. ORTHOTRICHUM NIVALE.

Spruce, Catal. Musc. Amaz. et Andin., p. 3, no. 127 (a. 1867).

Elatiusculum pulvinatum fulvo-viride, inferne fuscescens, facie *O. rupestris* vel fere *O. cupulati*. Caules 1½–2-pollicares, erecti, basi sola radicellosi, paulo et fastigiatim ramosi ramique sæpe iteratim innovando-proliferi. Folia sat valida confertiuscula, erecto-patentia vel patentia, stricta recurvulave, siccando appressa, anguste ovato-lanceolata (4·0 × ·9 mm.)—quasi longe lingulata—obtuse apiculata, basi decurrente hyalinâ excéptâ subopaca, utraque facie asperula, carinata, supra medium canaliculata, margine toto fere revoluto, costa infra apicem evanida; cellulæ superiores mediæque minutæ rotundo-hexagonæ pachydermes alte papillosæ, plurimæ inferiores longiores lineari-rectangulæ sub-lævissimæ pellucidæ. Flores monoici: ♀ terminales, innovatione mox superveniente quasi-laterales. Bracteæ suberectæ, foliis

submajores, basi dilatatæ pellucidæ plicatæque. Vaginula nuda, ocrea brevi. Pedicellus perbrevis, in capsulæ collum sensim abiens, Capsula immersa, obovato-pyriformis, pallida, ore vix rubescens, striis 8 flavis angustiusculis percursa, siccando levissime 8-costata, collo distincto post siccationem 5-angulo. Peristomium duplex; dentes externi capsula concolores, teneri, madore convexo-conniventes, sicci suberectis primum 8, mox in 16 subulatos, linea media exaratos, papillulosos, margine sæpe crenatos, secedentes; ciliola interni 8, dentibus æquilonga, tenuissimis, cellulis uniseriatis constantia. *Calyptra capsulam totam obvelans*, oblongo-campanulata, virescens, purpureo-acuminata, 12-plicata, pilis rarissimis erectis scabridis ad plicas sparsa. Andræcia axillaria, foliis celata, rufescentia, ovalia compressa; bracteæ sub 8, ovatæ obtusatæ concavæ arcte imbricatæ; antheridia plurima elongata paraphysata.

Hab. Andes Quitenses, in montis altissimi *El Altár* latere australi, supra prædium *Titaicum*, alt. 13,000 ped. Angl., ubi ad saxa nive recente obtecta, mense Novembri, a. 1858, legi.

Syn. "*O. striatum*, L." Mitt. in 'Musc. Austro-Amer.' p. 189 (a. 1869).

O. rupestre, Schleich., huic certe proximum, differt fructu subemerso; calyptra insigniter villosa; peristomio majore, ciliis validioribus e cellulis biseriatis conflatis, etc.—*O. striatum*, L. capsula omnino ecostata; calyptra dimidiam capsulam solum obtegente; ciliis 16, latis et quasi-moniliatis, longe alienum est.

7. Scopelophila Agoyanensis.

Weisia (*Scopelophila*) *Agoyanensis*, Mitt. 'Musci-Austro-Americani' p. 135 (1869).

On the 10th of July, 1845, in walking up the narrow and rather steep gorge leading from the village of Pierrefitte to the Baths of Cauterets, in the Pyrenees, and herborising by the way, I gathered tufts of a barren moss growing on crumbling ophitic shale, which was entirely new to me; nor did closer examination at my quarters throw much light on its affinities, for, although when growing it was not unlike a muticous form of *Tortula unguiculata*, the microscope showed it to be very different. I gathered it afterwards in two other widely separated sites, but still in the same unsatisfactory sterile condition. The following are its chief characters:—

Tufts dense and very fragile, greenish only at the growing apex, the lower part being of a dull reddish, or port-wine colour. Stems an inch high, erect, simple or forked, very sparingly radicellose. Leaves crowded, from a suberect and sharply-keeled (almost complicate) base reflexo-patulous,—when dry incurvo-crispate,—ligulate, gradually widening upwards so as to be somewhat spatulate, narrowing again in the upper fifth, but very obtuse at the point; margin entire, recurved below the middle; nerve failing a little below the point; cells plane and smooth, those of the lower third pellucid, rectangular, twice as broad as long, upper cells 4—6 times smaller, subquadrate, opaque; but three or four rows of marginal cells are thicker-walled and discoloured, so that the

lower leaves have a red, the upper a yellowish, border. On some stems the leaves are here and there longer, forming a coma—probably a sterile ♀ flower, but containing no genitals. (Terminal gemmiform ♂ flowers have since been found, but no fruit to this day.)

The comparative anatomy of mosses, especially as to the correlation of leaf-structure to fructification, had at that time been only imperfectly studied, and my own knowledge of it was very slight. It was therefore with great diffidence that I published specimens in my exsiccata under the name of *Encalypta? ligulata*, n. sp.; the broadly-marginate leaves seeming to approach it, though very remotely, to *Encalypta commutata*, Nees et H.

Leaving for a while the further consideration of its affinities, I must take my readers with me to the Andes of South America, about 1½ degrees south of the equator, and at an elevation of a little over 5000 English feet, where the river Pastasa, one of the northern feeders of the Amazon, and already become a considerable stream, rushes along a deep valley (the Gorge of Banos) at the northern base of the volcano Tunguragua, and at the cataract of Agoyan plunges down a cavernous cliff into a deep lake-like basin, bordered on each side by walls and fallen blocks of mica-schist—richly clad with mosses; and thence emerging resumes its tumultuous course, which scarcely slackens until reaching the great Amazonian plain.

I explored the environs of this cataract pretty thoroughly in July and August, 1857, and on some of the mossy blocks I found growing in great profusion what seemed the identical *Encalypta ligulata* of the Pyrenees. It was covered with ripe capsules, and (as may well be imagined) I secured a large stock of specimens. It was a taller, firmer plant,—scarcely at all fragile,—and the lower (or inner) portion of the tufts was of a brownish black, and not the vinous tint of *E. ligulata;* but that it differed any otherwise, with only memory to aid me, I could not venture to affirm. The capsule was gymnostomous, and, taken in conjunction with the strap- or tongue-shaped foliage, reminded me much of two mosses I had frequently gathered in the forests of the Amazon, viz., *Hyophila Tortula* (Schwgr.) and *H. melanostoma*, Mitt.; which, however, had leaves incurved at the sides, without any recurved margin or any border of discoloured cells, and a much longer and twisted calyptra.

There was no *à priori* reason why the Pyrenean and the Andine móss should not be specifically the same, since it has been ascertained that certain mosses of Western Europe reappear in the Andes; of which, indeed, I had examples before my eyes. *Jungermania hyalina*, Hook., grew on rocks moistened by spray from the Falls of Agoyan, exactly as it does in similar sites in Europe. *Bryum filiforme*, Dicks. (= *Br. julaceum*, Sm.) abounded by the Pastasa a few miles lower down, and fruited far more luxuriantly than it usually does in the British Isles; and *Tortula* (*Didymodon*) *brachydontia*, Bruch., grew a little above the falls; while *Hypnum rusciforme*, Neck., var. (= *H. aquaticum*, Hampe), covered half-

immersed stones in the Pastasa itself. The most conspicuous companions of the *Scopelophila* (as we must for the present call it) had, however, a distinctly tropical aspect. Three or four species of *Macromitrium* spread over rocks and trees in great Hypnum-like flakes, studded with stalked, silky brown or golden cones (the calyptras). Other mosses were *Holomitrium pulchellum*, Mitt., several species of *Hookeria*, *Frullania*, *Madotheca*, &c.; and minute Daltonias perched on the slenderest twigs of overhanging trees and bamboos.

When three years later I broke down in health, and for many years together was unable to use the microscope at all, I was obliged to entrust the naming of my South-American mosses to Mr. Mitten, and I had no doubt he would discriminate between this Andine moss and its Pyrenean congener, if they should be really distinct. His published account of the former appeared in the twelfth volume of the 'Journal of the Linnean Society,' under the name *Weisia* (*Scopelophila*) *Agoyanensis*, Mitt. He did not point out how it differed from the Pyrenean moss, but merely remarked: "The other species referable to this group [*Scopelophila*] are the *Encalypta? ligulata*, Spruce, Musc. Pyr. 331, and a few others from India and Java; all agree in their rather firm smooth foliage and slender pale fruit-stalk." (*l.c.*, p. 135). (*S. ligulata*, however, has soft fragile foliage.)

The following diagnosis embodies all the differences I have been able to detect. It will be seen that the two species are separated rather by the sum of small differences than by any one marked character. It is, however, only the foliage we are able to compare, the fruit of *S. ligulata* being still a desideratum.

Scopelophila Agoyanensis, *Mitt.*, *l. c.* (*Weisia* § 5, *Scopelophila*). —*S. ligulatæ* Pyrenæorum simillima, validiuscula tamen (nec fragilis), apicibus novellis solum virescens, foliis adultioribus fuscis v. fere nigris (in *S. ligulata* sordide rubro-vinolentibus). Radicellæ pallidæ tenuissimæ ramosæ ad caulem inter folia paulo copiosiores quam *S. ligulatæ*. Folia parum diversa, subbreviora, spathulato-ligulata rotundata obtusutave, rarius solum obtusa, carinata, alis recurvulis apice explanatis, sicca apice incurvo-crispa, superne magis opaca (quam *S. ligulatæ*) inferne tamen spatio longiore—a basi adusque v. ultra medium—pellucida; cellulis omnibus planis iis *S. ligulatæ* forma et magnitudine conformibus, marginalibus superne sub 6-, inferne sub 4-seriatis minutis flavido-limbata; costa sublongiore, vix sub summo apice evanida. Flores dioici; ♀ in caule remove innovando terminales. Bracteæ propriæ vix ullæ nisi folia suprema cateris paulo longiora pellucidioraque, pedicelli vaginulam laxe cingentia. Pedicellus 8–9 mm. longus, e viridi stramineus, haud validus. Capsula 1·4 × ·6 mm. ovalis v. ovato-oblonga, virescens, ætate fusca, leptodermis, erecta v. parum inclinata et subgibba, ore vix constricto annulo duplici angusto diutius persistente instructa, cæterum gymnostoma, sicca vix mutata estriata parum corrugata. Calyptra operculum paulo excedens viridis, apice nigrescens, conico-acuminata dimidiata, recta (nec torta). Operculum capsula plus duplo brevius, pallidum,

a basi convexa oblique rostratum, cellulis rectiseriatis conflatum. Sporæ parvulæ virides læves. Flores masculi haud visi.*

To resume the question of affinities. My own crude reference of *S. ligulata* to *Encalypta* is at once set aside—now that the fruit of a closely-allied species is known—by its small dimidiate calyptra; besides by its lacking the large cloven papillæ that stud the leaves of Encalyptas.

The species was next described, from my specimens, by Carl Müller ('Synopsis Muscorum,' a. 1851), who thought he had satisfactorily proved it a *Zygodon*: a genus, however, which (taken even in its widest acceptation) differs from *Scopelophila* in its papillose, immarginate, sharp-pointed leaves, and in its long-necked, ribbed, exannulate capsule. I do not know of anything further having been published respecting it until it fell to Mr. Mitten's lot to describe the South-American species, as above stated. To properly estimate his judgment of its affinities, it will be requisite to sketch briefly his genus "*Weisia*," which he thus defines (Conf. 'Musci Austro-Amer.,' p. 14, et pp. 129–141):—"Perianthium si adsit dentibus rectis 8 vel 16 ad basin usque discretis. Folia viridia vel flavo-viridia margine incurva, cellulis parvis obscuris areolata." He proceeds to divide it into eight sections, viz.:—

§ 1. *Systegium*, Schimp. (= *Phascum crispum*, &c.)

§ 2. *Gymnostomum*, Hedw. n. sp. (incluso *Hymenostomo*, R. Br.).

§ 3. *Euweisia* (= *W. controversa* et affines).

§ 4. *Hymenostylium*, Brid. (= *Gymnostomum calcareum*, N. et H. et aff.)

§ 5. *Scopelophila*, M. "Theca gymnostoma. Folia spathulata obtusa, cellulis densiusculis lævibus, perichætialia propria nulla. . . . Thecæ in pedunculo gracillimo oblongæ, hucusque gymnostomæ tantum visæ." (Species tropicæ, Americanæ et Asiaticæ).

§ 6. *Hyophila*, Brid. "Theca gymnostoma. Folia lata sæpe involuta." (Species omnes exoticæ).

§ 7. *Tortularia*, M. "Theca peristomio e dentibus 8 vel 16 instructa. Folia spathulata. (Species omnes tropicæ, nisi pro peristomio præsente *Hyophilæ* ascribendæ).

§ 8. *Tapeinodon*, M. "Perist. depressum, dentibus parvis infra os thecæ insertis. Folia lata obtusa laxe areolata." (Species Americæ tropicæ et Indiæ or.).†

Whatever may be thought of Mitten's "*Weisia*," in the aggregate,

---

* Mr. Mitten has a second species, *Weisia* (*Scop.*) *cataractæ*, n. sp., gathered by myself in the same locality, and probably about the base of the fall, where it was kept perpetually moist. It is said to differ from *W. Agoyanensis* in the subacuminate leaves, with a shorter pellucid base; but I have no specimen of it, and can give no opinion on its specific merits.

† All these sections seem to me closely related, and not unnaturally combined into a single genus, except the last, *Tapeinodon*, Mitt., which is a very curious group, certainly *sui generis*, and whose place even in the order is not easy to assign. In the same year (1869) C. Müller took up this group, of which the type-species, *Weisia obtusa*, Brid. a. 1806 (= *Didymodon splachnifolius*, Hook. Musc. Exot. t. 76, a. 1820) is found in several islands of the West Indies, and described it as a new genus, *Splachnobryum*, referring it to the tribe *Splachnaceæ*, and adding some new species; and there is no doubt that his name—claiming at

there can be little doubt that the section (or subgenus) *Scopelophila* is here in its right place, viz., next to *Hyophila*, and possibly a subsection of it; with some affinity on the other hand to *Euweisia* and *Gymnostomum*. I have seen in their native habitats two species of *Scopelophila*, and at least two of *Hyophila;* and I can testify to their close resemblance. If we compare their structure, we observe no differences sufficient to keep them apart. *Hyophila* has, it is true, leaves with plane and concolorous margins. *Scopelophila ligulata* has the leaf-margin discoloured and slightly recurved below; but in *S. Agoyanensis* it is rather the whole leaf which is somewhat reflexed on each side, but without any distinct recurvation of the very margin. Were the character even more marked than it is, it could not suffice to sever the two groups; otherwise we might have to place *Pottia lanceolata* in one genus and *P. cæspitosa* in another — the latter indeed being a true *Hyophila*, as to the foliage, although the presence of a peristome would place it in Mitten's next section, *Tortularia*. The calyptra is not twisted in every species of *Hyophila*, and thus affords no constant distinction from *Scopelophila*.

---

once generic rank—must be preferred to Mitten's contemporaneous and very appropriate sectional name, *Tapeinodon*. (Conf. Braithwaite in Journ. Bot. July, 1872, p. 193, sub *Splachnobryo Wrightii*, C. M.) Later on, Müller added two more species: *S. indicum*, C. M., and *S. Spruceanum*, C. M. (= *Weisia splachnifolia*, Mitt. pro parte). I had gathered *S. Spruceanum* in Nov., 1855, in the roots of the Peruvian Andes (province of Maynas) growing on gypsaceous mud upon wet rocks by the river Huallaga and two of its tributary streams—certainly an unusual habitat for a Splachnoid moss. I described it in my MSS. from fresh specimens, and called it *Trichostomum Maynense*, considering it nearer *T. tophaceum* than any other moss I could call to mind, although widely different in its pellucid laxly-areolate leaves. As it diverges from the original generic character (Braithw., *l. c.*) in having both axillary and terminal ♂ flowers, in the didymodontous peristome, and in the smaller, nearly straight calyptra, I reproduce here my description, as an aid to determining the nearest relatives of these curious mosses:—*Splachnobryum Spruceanum*, C. M., dioicum, humillimum cæspitosum. Caules rubelli, 7—8 mm. alti, erecti, simplices v. ramos 1—3 proferentes, basi radicellosi. Folia angulo 45° patentia, haud arcte imbricata, ovalia v. subovata, apice rotundata obtusatave; margine parum reflexo; costa vix ante apicem evanida; cellulis majusculis 4—6-gonis, aliis prosenchymaticis, aliis parenchymaticis mixtis, marginalibus rectangulis, alaribus vix diversis. Flores dioici, *utriusque sexus eparaphysati;* ♂ gemmiformes, axillares et terminales, plerumque octandri. Fl. ♀ terminales; bracteæ foliis duplo fere longiores, ovali-oblongæ, margine revoluto. Pedicellus brevis (5—7·5 mm.) ruber, siccus dextrorsum contortus. Capsula cylindracea, superne parum latior, erecta, raro subinclinata, olivacea, ore rubro, collo vix ullo. Calyptra breviuscula dimidiata. Operculum brevi-conicum. Peristomium rubrum, longe infra capsulæ orificum oriundum, madore connivens, siccitate reflexo-patulum; d. 16, breviusculi, fere v. usque ad basin bipartiti, crura cellulis 8 uniseriatis constantia, membrana hyalina velata, interdum in unum coalita.—The large pellucid cells of the broad leaves point, at first sight, to *Splachnum;* but as the cells are almost equally divided between pointed and truncate (Mitten calls them all prosenchymatous, which I did not find them), this character seems to sever *Splachnobryum* from both *Splachnaceæ* and *Tortulaceæ*, which have normally all the cells truncate, or parenchymatous. The peristome is not unlike that of some *Splachnaceæ*, in the teeth springing from within the mouth of the capsule, connivent when moist, recurved when dry; but I know not of the absolute absence of paraphyses from any *Splachnaceæ*, where, on the contrary, they are usually a very marked feature. In fine, if the genus must be referred to *Splachnaceæ*, it can only be as an outlying and very aberrant member thereof.

The alternative of considering *Scopelophila* an aptychous member of the subtribe *Zygodonteæ* seems scarcely admissible, if all the other differences, above-enumerated, be duly estimated; and if C. Müller had possessed the fruit of *Scopelophila* he would (I presume) no more have placed it in *Zygodon* than I should in *Encalypta*, but, in all probability, alongside *Hyophila*, as Mitten has done. Bridel's *Hyophila* is, however, for C. Müller a member of the genus *Pottia*, Ehrh., which he divides into the four sections following, viz., *Anacalypta*, *Eupottia*, *Hyophila*, and *Hymenostylium*. His definition of *Hyophila* is rather fuller than Mitten's, and runs thus:—"Theca gymnostoma, rarissime peristomata. Folia plus minus lata, marginibus involutis, basi pellucide superne minute opace areolata, plerumque facile emollientia. Infl. dioica. Calyptra plerumque angusta subtorta.—A *Pottia* nunquam discerni potest, nam areolatio folii omnino *Eupottiæ* est." There is no denying that *Hyophila* stands in quite as close a relation to *Eupottia* as to any section of Mitten's *Weisia*. *Pottia* is, in fact, one of those central groups with multifarious affinities, osculating with several other groups, which help to prove (if proof were needed) that no purely *linear* sequence of either genera or species can ever be thoroughly natural.

Returning to Mitten, *op. cit.*, we find him not admitting *Pottia* even as a section, but merging it in his *Tortula* § 8, *Desmatodon*.

If we consult now the latest of new bryological systems, viz., Lindberg's 'Musci Scandinavici in systemate novo naturali dispositi,' we have the genus *Tortula* of Musc. Brit.—*Barbula* of Bryol. Europ. —divided mainly into three genera, *Tortula*, *Mollia*, and *Barbula*: the lateral-fruited *T. squarrosa* having a genus to itself (*Pleurochæte*, Lindb.); and each of those three genera is enriched by sundry species abstracted from neighbouring genera of previous authors. "*Tortula*, Lindb." comprises *Syntrichia* (Brid.); *Desmatodon*, Brid. pro parte; *Anacalypta*; *Pottia*; and *Phascum bryoides*.—"*Mollia*, Schrank. Lindb." is compounded of excerpts from eight genera of Bryol. Europ. and Syn. Musc. Europ., in the following order:— 1. *Barbula tortuosa* and *fragilis*; 2. *Trichostomum flavovirens*, Bruch.; 3. *Didymodon cylindricus*, *brachydontius*, &c.; 4. *Eucladium verticillatum*; 5. *Gymnostomum curvirostrum* and *tenue*; 6. *Weisia viridula* (i. e., *controversa*), &c.; 7. *Hymenostomum microstomum*, &c.; 8. *Phascum* (*Systegium*) *crispum*.*

---

* The species grouped under *Mollia* by Schrauk were—as I gather from Müller's 'Synopsis,' for I have not Schrauk's 'Baiersche Flora' (1789) at hand—the five following:—*muralis*, *ruralis*, *subulata*, *tortuosa*, and *unguiculata*. It therefore corresponded to the *Tortula* of Hooker and Taylor, and to the *Tortula* and *Barbula* combined of Hedwig; and was remote enough from the *Mollia* sought to be re-instituted. Is there to be no limit to this disinterment and attempted resuscitation of fossilized names, especially of genera—in most cases used by their modern restorers in a much-modified, and sometimes in a very different, sense from that of the original propounder? If the use of names be to enable us to discourse about things, it is plain that every change of a familiar name of long standing, whether in favour of an older or a newer name—and especially where made for the mere sake of the name—involves loss of time to the student, and tends to retard his acquiring a perfect knowledge of the thing itself.

If, with Mitten, we consider *Scopelophila* and *Hyophila* congeners of *Hymenostomum* and *Weisia*, then they might be *Molliæ* of Lindberg; but if, following C. Müller, we put *Hyophila* with *Pottia*, they would be *Tortulæ* of Lindberg.

We see, then, that there is great discrepancy in the views of our most eminent bryologists, and that many genera are at present in what can only be styled a state of very unstable equilibrium; so that it seems preferable to retain *Scopelophila*, *pro tem.*, as a genus apart, by the side of *Hyophila*, until some agreement can be come to as to its collocation in a more comprehensive genus. There can be no doubt that since the ancient *Gymnostomum* was (very properly) broken up, and the members thereof turned adrift, they have been in too many instances recklessly bandied about among peristomial genera, to which they had often a merely superficial resemblance; and that there is great need of a rigorous reconsideration of their true affinities—a task which can properly be performed only by one who has a familiar acquaintance with the mosses of the whole world. Furthermore, the analytical process has been pushed so far of late years that a little more subdivision would elevate almost every single species to the rank of a genus; and what is now needed is a judicious synthesis; nor should this be attempted by a bryologist skilled only in European species, but by one whose knowledge of mosses is universal; otherwise the resulting genera, instead of being each (what it ought to be) a large natural assemblage of species, would be liable to turn out an incoherent medley.

I have not yet quoted the most recent writer on *Scopelophila*, namely, the late excellent Professor Schimper. In the first edition of his 'Synopsis' it is passed over without mention, although he had already picked out specimens of it from intermixed *Grimmia atrata*, gathered by himself in the Austrian Alps so long ago as 1840; but in the second edition (Addenda, p. 852) he describes it —from the barren plant only—as a new genus:—"*Merceya*. Genus valde paradoxum, cum nullo europæo commutandum, clar. A. de Mercey, floræ bryologicæ hyerensis et pyrenaicæ scrutatori acutissimo, dedicatum." Yet he had had in his possession for several years good, fruited specimens (furnished by myself) of the Andine species, which, as I have shown above, is so closely related to the Pyrenean species as to be not easily distinguishable. Hence it is plain that he had never examined those specimens, nor read Mitten's remarks on them; otherwise, to his experienced eyes, the genus would surely no longer have appeared paradoxical.

One of my objects in drawing up the foregoing account has been to vindicate the priority of Mr. Mitten's name, which, whether as genus or subgenus, has a right to be respected. When an author gives substantive names to his sections of genera, and adds a clear definition of them, he tacitly lays claim to their preservation by his successors, who—possibly aided by ampler materials—may judge it desirable to elevate any of those sections to the rank of separate genera. M. de Mercey's name, therefore, remains available for some genus hitherto unnamed, and (it may be hoped) whose claim to generic rank is indisputable.

(To be continued).

ON THE PLANTS OF (NORTH) ARAN ISLAND, CO. DONEGAL.

By Henry Chichester Hart, B.A.

The island of Aran is situated on the north-west coast of Donegal, and lies under the 55th parallel of north latitude. It is about a mile and a half distant from the mainland at the southern extremity, and from two to four miles elsewhere; there are, however, many other small islets intervening between Aran and the mainland, so that there is only about a mile of a clear and shallow channel around the eastern shore of the island. The best point from which to reach Aran is Burton Port; the boatmen here are accustomed to the passage, and what with shallows, rocks, rapids, currents, and numerous windings amongst the islets, it is often by no means an easy journey.

This (northern) island of Aran is to be distinguished from the southern islands of the same name at the entrance of Galway Bay, of whose Flora I published an account in 1875.*

Like many other Atlantic islands, Aran slopes eastward to sea-level, and faces the ocean with a wall of cliffs. The scenery along these cliffs is superb, especially that of the bay east of Torneady Point, where they range from 400 to 550 feet, rising perpendicularly from the water's edge.

The island is about three miles and a quarter wide at its southern extremity, and about three miles and three-quarters long from north to south. It contains 4355 acres, or nearly seven square miles. Its population at the census of 1871 was 1174. The low ground from sea-level to about 100 feet along the eastern side, and especially in the southern half of the island, is almost exclusively the cultivated and inhabited portion of the island. Inland there is good mountain pasturage and abundance of turf for fuel, but the general appearance of the interior of the island is an undulating waste of heather and bog. There are eight small scattered lakes, of which Lough Shore, about three-quarters of a mile round, is the largest. The highest point in the island is Cluidaniller, 750 feet.

The formation of Aranmore is chiefly a hard reddish sandstone, sometimes shaly, but generally purely siliceous, and often turning into quartzose. The red granite of the Rosses reappear here in small quantities, grey being more prevalent at the south-eastern corner of the island; there are many intrusive bands of trap; manganese and iron ore occur on the island, and at the south-western extremity there is a wonderful field of drifted boulders (drift apparently from the N.E.) of red granite lying on the sandstone; these extend for about a mile at from two to three hundred feet above sea-level, and the granite belongs to the adjoining district of the mainland called "The Rosses."

---

* 'A List of Plants found in the Islands of Aran, Galway Bay,' by Henry Chichester Hart, B.A. Dublin: Hodges, Foster, and Co. 1875.

My visit to Aran was in the middle of September, 1879; and although I only spent three days there, I left very little ground unexamined. I made a complete circuit of the island, and went round and botanised all the lakes as well as all the hills. The only part which I gave less time to than I wished was the cultivated ground which was still under crops. It is therefore possible that some weeds of cultivation which do not appear in my list may occur in Aran.

The Botany of Aran must be considered as an outlying portion of that of the mainland, and is interesting only as an island Flora. The only rarity I obtained new to the county was *Saxifraga hirta;* it occurred in very small quantities in the gully called Polldoo on the west side of the island, and is more thickly covered with hairs than any Irish form I have met with; *Trifolium medium* grows plentifully along the east shore in several places both north and south of Leabgarrow, it is a scarce plant in Ireland; *Elymus arenarius* had been previously discovered by Prof. E. Murphy, it grows in small quantities along the shore in two places south of Leabgarrow; it was stunted and bearing no inflorescence, and a very poor representative of this noble grass in its full luxuriance, as it may be seen on the western shore of Carrick Finn Island, about eight miles north-east from the locality on Aran.

The Flora of Aran belongs almost entirely to Watson's British type. Four alpine plants occur, *Sedum Rhodiola*, *Arctostaphylos Uva-ursi*, *Isoetes lacustris*, and *Juniperus nana;* all four descend to sea-level, both here and in other parts of Ireland, and are therefore by no means exclusively alpine plants, while of the latter I wish to remark that the decumbent form with short leaves grows luxuriantly on sea bluffs and rocky shores in numerous parts of the Donegal coast. There are also six plants belonging to Watson's Scottish type: *Saxifraga hirta*, *Antennaria dioica*, *Lobelia Dortmanna*, *Empetrum nigrum*, *Lamium intermedium* (a colonist), and *Elymus arenarius*.

The few trees which I observed were alders, sallows, &c., in the neighbourhood of the cottages, and in the wilder parts along the faces of the cliffs a low brushy growth of stunted oaks and a few birches may be met with. These two latter are native; all the other trees on the island are, I believe, introduced.

The following plants are especially abundant and characteristic of the vegetation in Aran:—*Sedum Rhodiola*, *Arctostaphylos Uva-ursi*, *Empetrum nigrum*, and *Juniperus nana*. *Arctostaphylos* appears chiefly inland about the tops, and on bluffs above one or two of the lakes; *Sedum Rhodiola* grows in extraordinary profusion at the south-western extremity, and with the others in many parts along the western cliffs. I have never seen any one of these four plants so abundant in any other part of Ireland.

By comparing this list with Mr. More's account of the Flora of Inish Bofin,* I find that the total for Aran is 232 species, and for

* "Report on the Flora of Inish Bofin, Galway," by A. G. More, F.L.S., M.R.I.A., in the Royal Irish Academy Proceedings, 2nd Series, vol. ii. (Science), 1876.

Inish Bofin 303. The following species occurring in Aran were not found in Inish Bofin :—

Caltha palustris
Cardamine hirsuta
Draba verna
‡Viola tricolor
Sagina apetala
Stellaria uliginosa
[Ulex europæus]
Trifolium medium
‡Alchemilla arvensis
Myriophyllum alterniflorum
Sedum Rhodiola
Saxifraga hirta
Helosciadium nodiflorum
*Ægopodium Podagraria
Antennaria dioica
Carduus pratensis
†Crepis virens
Arctostaphylos Uva-ursi
Vaccinium Myrtillus
Myosotis repens
Digitalis purpurea
Veronica officinalis
‡Veronica hederifolia
,, serpyllifolia
‡Lamium incisum
‡ ,, intermedium
Atriplex hastata
Beta maritima
Betula alba
†Salix cinerea
‡Alnus glutinosa
Quercus Robur
†Corylus Avellana
Juncus maritimus
Scirpus maritimus
Carex vulgaris
‡Alopecurus pratensis
Aira cæspitosa
Sclerochloa maritima
Catabrosa aquatica
‡Bromus sterilis
Elymus arenarius
Isoetes lacustris

Of these, however, *Sedum Rhodiola*, *Corylus Avellana*, *Betula alba*, *Salix cinerea*, *Carex vulgaris*, and *Aira cæspitosa* occur upon Inish Turk, which is only five miles north of Inish Bofin, while it is to be remembered that Aran is about eighty miles north of Inish Turk.

In conclusion, I take this opportunity of expressing my gratitude to Mrs. Charley, the owner of Aran, through whose kindness I obtained accommodation upon the island; and to Mr. Hammond, of Leckbeg, Burton Port, the courteous agent of the Marquess of Conynghame, to whose hospitality and local knowledge I was much indebted in that most remote country.

Ranunculus hederaceus, *L.*
,, Flammula, *L.*
,, acris, *L.*
,, repens, *L.*
,, bulbosus, *L.*
Caltha palustris, *L.*
Nasturtium officinale, *Br.*
Cardamine hirsuta, *L.*
Draba verna, *L.*
Cakile maritima, *L.*
Viola palustris, *L.*
,, tricolor, *L.*
Drosera rotundifolia, *L.*
Polygala depressa, *Wend.*
Silene maritima, *With.*
Oxalis Acetosella, *L.*
Sagina procumbens, *L.*
,, apetala, *L.*
Honkeneja peploides, *Ehrh.*
Stellaria media, *L.*
,, uliginosa, *Murr.*
Cerastium glomeratum, *Thuil.*
,, triviale, *Link.*
,, tetrandrum, *Curt.*
Hypericum pulchrum, *L.*
Geranium molle, *L.*
,, Robertianum, *L.*
Erodium cicutarium, *Sm.*
Linum catharticum, *L.*
Radiola Millegrana, *Sm.*

*Ulex europæus, *L.*
‡Trifolium pratense, *L.*
,, medium, *L.*
† ,, repens, *L.*
,, minus, *Sm.*
Lotus corniculatus, *L.*
Anthyllis Vulneraria, *L.*
Vicia Cracca, *L.*
,, sepium, *L.*
Spiræa Ulmaria, *L.*
Alchemilla arvensis, *Scop.*
Potentilla reptans, *L.*
,, Tormentilla, *Nestl.*
Rubus fruticosus, *L.* (discolor)
Rosa spinosissima, *L.*
Lythrum Salicaria, *L.*
Peplis Portula, *L.*
Epilobium montanum, *Schreb.*
,, palustre, *L.*
Myriophyllum alterniflorum, DC.
Montia fontana, *L.*
Lepigonum salinum, *Presl.*
,, rupicola, *Lebel.*
Sedum Rhodiola, *DC.*
,, anglicum, *Huds.*
,, acre, *L.*
Saxifraga hirta, *Sm.*
Hydrocotyle vulgaris, *L.*
Helosciadium nodiflorum, *Koch.*
*Ægopodium Podagraria, *L.*
Angelica sylvestris, *L.*
‡Heracleum Sphondylium, *L.*
Daucus Carota, *L.*
Hedera Helix, *L.*
Lonicera Periclymenum, *L.*
Galium verum, *L.*
G. saxatile, *L.*
Scabiosa succisa, *L.*
Tussilago Farfara, *L.*
Bellis perennis, *L.*
Solidago Virgaurea, *L.*
Achillea Ptarmica, *L.*
A. Millefolium, *L.*
†Matricaria inodora, *L.*
,, ,, *var.* maritima
†Chrysanthemum Leucanthemum, *L.*
‡C. segetum, *L.*
‡Artemisia vulgaris, *L.*
Gnaphalium uliginosum, *L.*
Antennaria dioica, *Gært.*

‡Senecio vulgaris, *L.*
,, sylvaticus, *L.*
,, Jacobæa, *L.*
,, aquaticus, *Huds.*
‡Arctium minus, *Schk.*
†Centaurea nigra, *L.*
Carduus lanceolatus, *L.*
† ,, arvensis, *Curt.*
,, palustris, *L.*
,, pratensis, *Huds.*
‡Lapsana communis, *L.*
†Hypochœris radicata, *L.*
Apargia autumnalis, *Willd.*
†Leontodon Taraxacum, *L.*
†Sonchus oleraceus, *L.*
† ,, asper, *Hoffm.*
† ,, arvensis, *L.*
‡Crepis virens, *L.*
Hieracium Pilosella, *L.*
Lobelia Dortmanna, *L.*
Jasione montana, *L.*
Campanula rotundifolia, *L.*
Arctostaphylos Uva-ursi, *Spr.*
Calluna vulgaris, *Salisb.*
Erica cinerea, *L.*
,, Tetralix, *L.*
Vaccinium Myrtillus, *L.*
Erythræa Centaurium, *Pers.*
Gentiana campestris, *L.*
Menyanthes trifoliata, *L.*
Convolvulus sepium, *L.*
Myosotis repens, *Don.*
,, arvensis, *Hoffm.*
,, cæspitosa, *Schultz.*
Digitalis purpurea, *L.*
Pedicularis sylvatica, *L.*
‡Rhinanthus Crista-galli, *L.*
†Euphrasia officinalis, *L.*
,, Odontites, *L.*
Veronica Chamædrys, *L.*
,, officinalis, *L.*
‡ ‡ ,, hederifolia, *L.*
,, serpyllifolia, *L.*
Thymus Serpyllum, *L.*
Prunella vulgaris, *L.*
‡Lamium incisum, *Willd.*
‡ ‡ ,, intermedium, *Willd.*
‡ ‡ ,, purpureum, *L.*
‡Galeopsis Tetrahit, *L.*
Stachys palustris, *L.*
Primula vulgaris, *Huds.*

†Anagallis arvensis, *L.*
,, tenella, *L.*
Glaux maritima, *L.*
Armeria maritima, *Willd.*
Plantago Coronopus, *L.*
† ,, major, *L.*
,, maritima, *L.*
,, lanceolata, *L.*
Litorella lacustris, *L.*
‡Chenopodium album, *L.*
Salsola Kali, *L.*
Atriplex angustifolia, *Sm.* (A. erecta, *Huds.*
,, Babingtonii, *Woods.*
,, hastata, L. (deltoidea, *Bab.*)
Beta maritima, *L.*
‡Rumex obtusifolius, *L.*
,, Acetosa, *L.*
,, Acetosella, *L.*
†Polygonum Persicaria, *L.*
,, Hydropiper, *L.*
,, aviculare, *L.*
Empetrum nigrum, *L.*
‡Euphorbia Helioscopia, *L.*
Callitriche verna, *L.*
,, platycarpa, *Kutz.*
‡Urtica urens, *L.*
‡ ,, dioica, *L.*
†Salix cinerea, *L.*
,, repens, *L.*
Populus tremula, *L.*
Myrica Gale, *L.*
Betula alba, *L.*
†Alnus glutinosa, *Gart.*
Quercus Robur, *L.*
†Corylus Avellana, *L.*
Juniperus communis, *L.* (*var.* nana)
Orchis maculata, *L.*
Iris Pseud-acorus, *L.*
Narthecium ossifragum, *Huds.*
Juncus maritimus, *Sm.*
,, communis, *Mrey.*
,, squarrosus, *L.*
,, compressus, *Jacq.*
,, bufonius, *L.*
Luzula multiflora, *Jacq.*
Sparganium minimum, *Fries*
Lemna minor, *L.*
Potamogeton polygonifolius, *Pr.*
Zostera marina, *L.*

Eleocharis palustris, *Br.*
,, multicaulis, *Sm.*
Scirpus maritimus, *L.*
,, Savii, *S. M.*
Carex arenaria, *L.*
,, stellulata, *Good.*
,, vulgaris, *Fries.*
,, præcox, *Jacq.*
,, glauca, *Scop.*
,, extensa, *Good.*
,, distans, *L.*
,, binervis, *Sm.*
Anthoxanthum odoratum, *L.*
Alopecurus pratensis, *L.*
‡Nardus stricta, *L.*
Phragmites communis, *Trin.*
Agrostis canina, *L.*
,, vulgaris, *With.*
,, alba, *L.*
†Holcus lanatus, *L.*
Aira cæspitosa, *L.*
,, flexuosa, *L.*
,, caryophyllea, *L.*
,, præcox, *L.*
‡Arrhenatherum avenaceum, *Beauv.*
Triodia decumbens, *Beauv.*
Molinia cærulea, *Mœnch.*
Glyceria fluitans, *Br.*
Poa annua, *L.*
Scleroclıloa maritima, *Lindl.*
Catabrosa aquatica, *Presl.*
Cynosurus cristatus, *L.*
Dactylis glomerata, *L.*
Festuca ovina, *L.*
‡Bromus sterilis, *L.*
B. mollis, *L.*
Triticum repens, *L*
,, junceum, *L.*
Elymus arenarius, *L.*
Equisetum arvense, *L.*
Polypodium vulgare, *L.*
Lastræa Filix-mas, *Presl.*
,, dilatata, *Presl.*
,, æmula, *Brack.*
Athyrium Filix-fœmina, *Roth.*
Asplenium Adiantum-nigrum, *L.*
,, marinum, *L.*
Blechnum boreale, *Sw.*
Pteris aquilina, *Sw.*
Osmunda regalis, *L.*
Isoetes lacustris, *L.*

SHORT NOTES.

The Flowering of Primula scotica, *Hook.*—In the early part of May, 1880, in company with a friend, I visited the Links of Dunnet, in Caithness. We marked twelve plants of *Primula scotica*, Hook., each of which had one scape in flower. During the year my friend observed and recorded the progress made by these plants. On 5th July the flower scapes of May were in fruit, and seven of the plants were in flower for the second time. By 16th August the flower scapes of July were in fruit, and two of the plants had flowered a third time. Thus, of the twelve plants observed in one year, five flowered once, five twice, and two thrice. I have plants of *P. scotica* in my herbarium, which exhibit the following number of scapes at each period of flowering in one year:—1st, plants which have flowered once in one year—(*a*) with one scape; (*b*) with two scapes. 2nd, plants which have flowered twice in one year—(*a*) with one scape both times; (*b*) with one scape the first time, and two the second; (*c*) with two scapes the first time, and one the second; (*d*) with three scapes the first time, and two the second. 3rd, plants which have flowered thrice in one year—(*a*) with one scape each time. It is evident from the above that the number of scapes on a plant is not always a trustworthy indication of the periods of flowering in one year. I have one curious plant in which a scape and single pedicel stand side by side. The plant has flowered twice in one year—first with the above-mentioned scape and pedicil, and second with one scape. It was collected by my friend on the Links of Dunnet between 12th and 14th July, 1880. In my herbarium I have specimens in which the normal form of flower and that of the so-called variety *acaulis* are combined in the one plant. These plants have flowered twice in one year—first like *acaulis* and second like *scotica*. I collected them and plants of *scotica* and *acaulis* growing on the heath to the west of the Standing Stones of Stenness, in Orkney, on 24th of September, 1880. The above observations show that the so-called variety *acaulis* sometimes occurs on the same plant as the species. In other words, the species *scotica* may have a scape or be acaulescent. In my experience the height of *scotica* varies from three-quarters to seven inches, and that of *acaulis* is about one inch. The earliest and latest dates on which I have found *P. scotica* in flower were respectively 25th April, 1880, and 19th September, 1879.—Henry Halcro Johnston.

A New British Carex.—The following note, signed with the initials of Mr. F. A. Lees, is from Hardwicke's 'Science Gossip' for December last. We hope soon, by the kindness of Mr. Lees, to publish a detailed description of what appears to be an interesting novelty:—"At first, sparingly in July, later more abundantly in August, I observed a species of sedge exceedingly graceful in appearance, growing in tufts in deep shade, out of crannies of the

old moss-grown sandstones at Plumpton Rocks, near Knaresborough. At first, from its narrow deep green leaves as long as its flowering stem, from its interrupted spike with oval spikelets, its pointed dark glumes, and its remarkably developed leafy bract, I thought it the variety *nemorosa* (Lumnitz.) of *Carex muricata*. Not feeling satisfied, however, I sent examples to Mr. H. C. Watson. He pronounced them at first *C. polyrhiza* (Hoppe), but expressed doubt. Specimens went from him to Kew Herbarium, where Mr. Baller [Baker] I believe detected their affinity rather with *C. pilulifera*, but diverging so distinctly from that type, having such long bracts, a straight not arcuate rachis, and not a couple of round pill-like female spikelets, that Mr. Watson wrote me the plant was new, and quite sufficiently distinct to merit a varietal if not a specific name. I have therefore bestowed upon my sedge of shady rocks the name of *C. Saxumbra*. I hope soon to describe and figure it.—F. A. L."

Notices of Books and Memoirs.

The Botanical Record Club: Phanerogamic Report for 1879, *and Cryptogamic Report for* 1879 *and* 1880. By the Referees and Editor.

We have already expressed our satisfaction that the adverse circumstances which at one time threatened the extinction of this useful Club had been overcome; and the interesting Report now before us is a good specimen of the work undertaken by the members. We had hoped that a union might have been effected between the Botanical Exchange Club and the Record Club; but this does not seem to have been thought practicable. As reconstituted, the Record Club is under the management of four referees (Prof. Babington, Mr. Baker, Mr. H. Boswell, and Dr. Carrington), an editor (Mr. F. A. Lees), and a secretary and treasurer (Mr. C. Bailey), who holds a similar post in connection with the Botanical Exchange Club. One result of the existence of two botanical clubs is a division (real or apparent) among British botanists—those who are most active in supporting the one being as a rule conspicuously absent from the reports of the other; and we miss from the most recent Report of the Record Club the names of several of those who were among the earliest and most active of its members.

The contents of the present Report are of great value and interest, although they do not lend themselves to quotation so easily as the notes in the Exchange Club Report. Besides the usual "new county records," "general locality list," &c., we have "basis lists" for the counties of Cardigan and Peebles—the former, containing 351 species, by Mr. H. Lewis Jones; the latter, with 319 species, by Mr. A. Brotherston; "the only counties now remaining from which lists of common plants (compiled from actual recent observation) are still lacking, are Flintshire, Wigtonshire, and West Ross."

The Cryptogamic Report, which is confined to the bryological section, is especially interesting. County catalogues are given for

South Devon (R. V. Tellam and John Ralfs), North Somerset (Dr. H. F. Parsons), Dorset (the Rev. H. H. Wood), Middlesex (Dr. Eyre de Crespigny), Hereford (Rev. A. Ley), Merioneth and Chester (John Whitehead), South-east York (Dr. H. F. Parsons), Cumberland (Rev. R. Wood), and Isle of Mull (G. Ross). There are also new county records for West and East Cornwall and North Lincolnshire, the latter containing the diagnosis of a new form of *Eurhynchium striatum*, which Mr. Lees proposes to call *arcuatum;* "its most striking feature is its beautiful deep-green colour, its short arcuate branches, and its squarrose leaves, more crowded on the stem and more acuminate than in *striatum;* and too broad, too little attenuate at the point, and too strongly serrated and striated for *striatulum*." We wish the Record Club every success, and trust that no further hitch may occur to hinder its usefulness.

J. B.

Species, Genera, et Ordines Algarum, seu descriptiones succinctæ specierum, generum, et ordinum, quibus Algarum Regnum constituitur. Auctore Jacobo Georgio Agardh, Bot. in Acad. Lund. Prof. Emer. Vol. III., Pars ii. Morphologia Floridearum. Lipsiæ: Apud T. O. Weigel. 1880.

A year has not elapsed since the announcement in the pages of this Journal of the appearance of a new work on the 'Morphology of the Florideæ,' by Dr. J. G. Agardh. We have now to record the publication, by the same author, of another volume. The present is a Latin edition of the first-mentioned work, which, having been written in Swedish, and printed in the Acta of the Academy of Stockholm, was a sealed book to many readers. The new work is intended to form Part II. of the third volume of the author's well-known 'Species, Genera, et Ordines Algarum,' to which it is a valuable addition.

In treating his subject, the Morphology of the Florideæ, the ex-professor shows, not only his own intimate acquaintance with the structure of the species described, and the characteristics of the different genera and orders, but a not less intimate acquaintance with the most recent literature on the subject. The observations and opinions of his contemporaries are examined carefully, and full reasons are given on points on which the author's experience differs from theirs.

After treating of the external forms of the plants, he describes their habit, the ramification and evolution of the external parts, and the formation of the root, stem, and fronds. He then treats of the structure of the internal parts, and of the organs of reproduction, namely, the antheridia, spores and sphærospores, and cystocarp, in most of the families of the Florideæ, concluding with observations on the so-called double fructification in this class of Algæ.

We are glad to see not only a table of contents, but an *index rerum*, and a list of the species whose structure is described in the work, with special references to their constituent parts. This is a great boon to algologists, and will facilitate the study of this important and useful work.

M. P. M.

Ueber Geysirs und nebenan enstehende verkieselte Bäume. Von Dr. Otto Kuntze. 'Das Ausland,' 1880 *passim*. (Separat-Abdruck.)

Dr. Kuntze, in the course of his study of the geysers of the United States and of Japan, observed that the silicic hydrate with which trees lying in the water are impregnated does not harden, but that trees exposed to the air gradually become silicified. He combats the view that wood has undergone silification in water, which he thinks especially difficult to understand in the case of woods of lesser specific gravity than water. He distinguishes between silicifaction and petrifaction. Petrified trees, he adduces evidence to show, sank under water, and becoming embedded in mud were then carbonised. On the other hand, trees were silicified *in situ* by means of comparatively small but constantly flowing quantities of the silica-holding water of geysers and hot springs which rises in the wood by capillarity, and evaporates gradually in the air. We doubt whether this has occurred in all cases. Even if geysers and hot springs be the sole sources of silicifaction, silicified leaves, stems, ferns, &c., have been observed on the borders of geysers in such positions as to render this notion of capillarity unnecessary. Further, may not standing trees have been to some extent silicified by receiving the heavy showers occurring on the leeward side of geysers, as figured by Sir Charles Lyell ('Principles,' 11th edition, vol. ii., p. 218)? Dr. Kuntze, in conclusion, finds from his observations fresh support for his theory that the plants of the coal-measures floated in the sea. S. M.

Revision von Sargassum und das sogennante Sargasso-Meer. Von Dr. Otto Kuntze. Mit einer Phototypie und einer Karte. Separat-Abdruck aus Engler's botanischen Jahrbüchern, I Band, 3 Heft. 1880. Leipzig: Wilhelm Engelmann.

The "Gulf-weed" is commonly supposed to consist of a single species (*S. bacciferum*), and to be confined to a particular portion of the Atlantic Ocean. In this treatise, Dr. Kuntze conclusively shows that both these suppositions are erroneous—that not only does the Gulf-weed consist of several species and many varieties, but that it is not met with in the same spots nor in similar quantities by different travellers at different times, the masses of detached sea-weed evidently drifting within certain limits, and never remaining stationary. It needs only a glance at the photographed specimens of floating Gulf-weed at the end of the pamphlet to see that they evidently belong to several different species; while from an excellent map, on which the author delineates the routes taken by those who have at various intervals described the *Sargassum*, it is obvious that his conclusions are drawn from legitimate grounds. By his own observations, as well as by those of previous writers on this subject, Dr. Kuntze demonstrates that the name of *Sargassum bacciferum* should no longer be retained as a specific one, and that Rumphius, who first described the so-called *S. bacciferum* as a floating form of a species growing on the shore, was quite correct in his statement. In proof of his position, the author adduces as

evidence the facts that *S. bacciferum* possesses no character sufficiently constant to distinguish it from *S. vulgare*. Neither the old plant nor the young one, which in this genus are bladderless and thick-leaved, have ever been found floating, nor has growth been accurately observed on the evidently detached imperfect portions, which, moreover, have always an unhealthy appearance, and a paler hue than the shore plants. He believes also that these detached portions do not last longer than three months.

In botany, as in politics, there may be said to exist two parties of opposite views—the one with a liberal tendency, which exhibits a desire to give a name and specific rank to every observed variety, and the other more conservative, which prefers to group a number of forms around certain types. Dr. Kuntze, who evidently belongs to the latter class, proposes to reduce the 300 hitherto described "species" to 11 central types ("formenkreise"), around each of which are grouped a number of intermediate forms, the species being characterised by their degree of differentiation of leaf and stem, while minor characters are derived from the shape of the leaves and air-vessels, &c.

It is obvious that in a genus the plants of which differ so greatly as do those of *Sargassum*, at different periods of their development, it is only possible to prove the value of specific characters by careful observation *in situ* of their growth and development, and recognising this fact, the author does not put forward his classification as a final or complete one, but merely claims to have made a beginning in clearing up some of the confusion which has existed hitherto regarding many of the species. He believes that as future investigation will present more intermediate forms, so the number of real species will probably have to be diminished. The alphabetical list of synonyms, each of which is referred to its equivalent in the author's classification, cannot fail to be exceedingly useful to algologists. Dr. Kuntze's researches bear evidence of that spirit of laborious and thorough investigation of detail so characteristic of the German nation, and as such form a valuable contribution to our knowledge of the genus. E. M. H.

We have received from Mr. J. E. Griffith, of Bangor, a reprint of his 'Flora of Carnarvonshire and Anglesea,' to the issue of which in the pages of the 'Naturalist' we referred at p. 124 of our last volume. It is a useful list, although very far from a complete flora in the usual acceptation of the term; there is no reference to previous records, the plants having been nearly all of them collected by Mr. Griffith in the stations he assigns to them. In a few cases the author has relied on dried specimens; and as he has kindly indicated these in the copy we have received, it may be well to enumerate them for the benefit of those into whose hands the list may fall. They are as follow:—*Matthiola sinuata*, *Draba incana*, *Lepidium latifolium*, *Cerastium alpinum*, *C. latifolium*, *Trifolium scabrum*, *T. strictum*, *Potentilla alpestris*, *Ajuga alpina*, *Malaxis paludosa*, *Juncus biglumis*, *J. triglumis*. *Dianthus plumarius* is to be substituted for *D. cæsius*. Further information as to the occurrence

of these is desirable, and we suspect some error with regard to such plants as *Epilobium alpinum*, *Eriophorum gracile*, and one or two more. Mr. Griffith notes that the middle of June is the best time for collecting the Anglesea Helianthemums, *H. guttatum* and *H. Breweri;* he adds, "The botanist must try to get [them] in the morning, as the petals all drop off before three p.m.; the flower only lasts about six hours." The best time to get *Lloydia* is from the 10th to the 18th of June. We hope that Mr. Griffith may be induced to undertake a more complete investigation of the botany of these two counties; a good flora of Anglesea would be a very useful and interesting addition to our local floras, and the author of this list has special opportunities for executing it.

Mr. Henry Ullyett, B.Sc., has recently published a little volume entitled 'Rambles of a Naturalist round Folkestone,' to which are appended various local lists, including one of the flowering plants and ferns containing about seven hundred species. Mr. Ullyett cautions botanists that seeds of various garden plants have been sown upon some parts of the slopes along the lower Sandgate road.

Under the title of 'The Guests of Flowers; a botanical sketch for Children,' Mrs. Meetkerke has published a pretty little volume treating in simple language of some of the more striking phenomena in connection with the fertilisation of flowers, showing how some are protected from the visits of useless insects, while they offer every facility to those which assist in the process of fertilisation. As an attempt to familiarise children with some of the more noteworthy of Dr. Kerner's investigations, it merits a word of praise.

We have received the third part of Dr. Braithwaite's 'British Moss-Flora,' containing the *Polytrichaceæ*. Both plates and letterpress continue to justify the high expectations formed of them; and we are glad to notice certain improvements in the arrangement of the latter which add materially to the readiness with which the work may be consulted.

We have also received Mr. A. R. Wallace's interesting volume 'Island Life,' and hope, if our space will permit, shortly to bring some extracts from it before the notice of our readers.

Mr. W. Mathews has reprinted from the 'Transactions of the Birmingham Philosophical Society' his paper on 'The Flora of Algeria considered in relation to the physical history of the Mediterranean Region and supposed submergence of the Sahara.' He gives an interesting analysis of the Algerian flora, and considers that the distribution of the plants of the Sahara militates strongly against the theory of its recent submergence.

The part of Engler's 'Botanische Jahrbucher,' issued in July last, contains an important paper on the geographical distribution of the *Juncaceæ*, by F. Buchenau, the first part of an exhaustive monograph of *Lythraceæ*, by E. Koehne, and contributions to the knowledge of *Araceæ*, by A. Engler.

The last part of Maximowicz's 'Diagnoses plantarum novarum asiaticarum' contains, *inter alia*, monographs of *Tilia*, *Geranium*, *Acer*, *Viburnum*, and *Iris*, so far as the species of Eastern Asia are concerned; and the diagnosis of a new genus of *Cruciferæ*—*Cælonema*—from China.

New Books. — R. Braithwaite, 'The British Moss-flora' (part iii., *Polytrichaceæ*, 5s.). — C. Darwin, 'The Movements of Plants' (Murray).—E. Hallier, 'Untersuchungen über Diatomeen' (Gera-untermhaus, Köhler).—H. Leitgeb, 'Untersuchungen uber die Lebermoose' (part vi. and last.) (Graz, Leuschner). — H. Muller, 'Alpenblumen, hire befruchtung durch insekten und hire aufassungen an dieselben' (Leipzig, Engelmann).—L. Pierre, 'Flore Forestière de la Cochinchine,' fasc. i. (Paris, Doin).—M. Willkomm, 'Illustrationes Floræ Hispaniæ insularumque Balearium,' livr. i. (Stuttgart, Koch).

Articles in Journals.

November.

Ann. Sciences Nat. (Botanique, 6th Series, vol. x. nos. 2, 3.)—A. Famintzin, 'The decomposition of carbonic acid by plants exposed to artificial light.'—Id., 'The influence of the intensity of light on the decomposition of carbonic acid by plants.'—A. Panchon, 'Researches on the *rôle* of light in germination.'

Bull. Soc. Bot. de Belgique (vol. xix. pt. i.).—E. Paques, 'Plants of Turnhout.' — A. Déséglise, 'Descriptions of French Roses' (contains two forms found also in Devonshire — *Rosa Cariomii*, Déségl. & Gillot (*Caninæ pubescentes*), and *R. Lucandiana*, D. & G. (*Caninæ Collinæ*).—A. Gravis, 'Floral anomalies of the pear and the morphological nature of the anther' (tt. 2).

Bot. Notiser.—F. W. Areschoug, '*Artemisia Stelleriana*, Bess.'—O. Nordstedt, 'New Swedish Plants, 1880.'

Naturalist (Huddersfield).—J. E. Griffith, 'Flora of Carnarvonshire and Anglesea' (concluded).—W. West, 'Bryological Notes.'—C. P. Hobkirk. 'How to examine a Moss.'

American Naturalist. — W. K. Higley, 'On the microscopic crystals contained in plants.'—E. L. Greene, 'Botanising on the Colorado Desert.'

Bull. Torrey Bot. Club. — A. Brown, 'Notes on New Jersey Flora.'—G. E. Davenport, 'Venation of *Botrychium boreale*.'—W. W. Bailey, 'The Herbarium Olneyanum.'

Œsterr. Bot. Zeitschrift.—G. Beck, 'On the development of *Lycopodium*.'—T. von Heldreich, '*Stachys Spreitzenhoferi*,' n. sp.—T. F. Hanausek, 'A monstrosity of *Zea Mays*.'—W. Voss, 'Mycological Notes.' — F. Krasan, 'Plant-distribution in Gorz and Gradisca' (contd.).—C. Baewitz, 'On *Botrychium boreale*.'—P. G. Strobl, 'The Flora of Etna.'—M. Gandoger, 'Pugillus Plantarum novarum vel minus recte cognitarum' (contd.; forms of *Cystopteris fragilis* and *Polypodium rhæticum*).

Botanische Zeitung.—K. Goebel, 'On the Morphology and Physiology of Leaves' (1 tab.).

Flora.—C. Kraus, 'On Heliotropism in *Hedera*.'—L. Celakovsky, 'On the dorsiventral inflorescence of *Borragineæ*,' &c.—A Minks, 'Morphological-lichenographical studies.'

Hedwigia.—P. Richter, 'Enquiry regarding a unicellular Phycochromacea.'—W. Voss, '*Peronospora vitida*.'—F. v. Thümen, on the same.—G. Winter, 'Mycological Notes.'

Magyar Növènytani Lapok.—V. de Janka, 'Romulearum Europæarum clavis analytica.'

Revue Bryologique (No. 6).—S. O. Lindberg, '*Schistophyllum Orrii*,' n. sp.'—Philibert, 'The true *Thuidium delicatulum*.'—Venturi, '*Thuidium pulchellum*.'—F. Renauld, 'On some Pyrenean Mosses.'—Ravaud, 'Bryology and Lichenology of Grenoble' (contd.)

Proceedings of Societies.

Linnean Society of London.

November 4, 1880.—Prof. Allman, F.R.S., President, in the chair.—The following gentlemen were elected Fellows of the Society:—Edward Brown (Newcastle-on-Tyne), H. E. Bressen (London), and T. Fraser Pippe (Bengal).—Mr. Arthur Bennett exhibited and made observations upon British specimens of *Chara obtusa*, Desv.—Mr. E. M. Holmes exhibited microscopical slides of two marine Algæ new to Britain, viz., *Dasya Gibbesii*, Harv., from Berwick-on-Tweed, and *Ectocarpus terminalis*, Ktz., from Weymouth; examples of *Callithamnion roseum* and *C. spongiosum* with antheridia, and a specimen of *C. brachiatum* with antheridia and trichophore on the same branchlet; and specimens of *Helminthora divaricata* with zonate tetraspores which have not hitherto been observed.—Mr. E. A. Webb exhibited a proliferous inflorescence of *Rubus Idæus*, L., in which the flowers were represented by elongated axes densely covered with minute pubescent bracts, the apical portions of which were fasciated.—Two botanical papers were read: I. "Contributions to the Flora of the North-Western Himalayas," by Prof. George Watt, of Calcutta. In this communication the author gives a general review of the geographical features of the W. Himalayas as elucidating their botanical aspects. The mountain chain divides into many approximating parallel ranges, whereof three predominate: 1. That nearest the plains of India with southerly spurs rises to an altitude of from 8000 to 14,000 feet, and thus the Ravee Basin, while having magnificent forests of *Cedrus Deodara* on its northern slopes, has on the southerly ones a more decidedly Indian facies of vegetation barely outside the humid influence of the rains of the plains. 2. The second range, comprising the subsidiary districts of Pangi, Lower Lahore, and British Lahore, after passing through lower hills and gorges, rises through lofty passes to altitudes of from 15,000 to 19,000 feet. Here, with short summers and perpetual

snow-clad mountains, the flora is altogether changed, as is the fauna, man himself included. In Pangi the atmosphere is dry in summer, infinitely drier than in the Ravee Basin; and a comparison of the plants found in the former but not in the latter area shows, by the marked atmospheric alterations and diminutions in the degree of humidity, a corresponding change in the vegetation, and birds and butterflies attest new climatic conditions. While several batrachians are common in the Ravee Basin, not one is known to inhabit Pangi or Lahore, and even the domestic fowl cannot survive the winter of Pangi. 3. The third range evinces a still further change of flora, and assumes a Thibetan type. The author describes three new species, *Ranunculus pangiensis*, *Arabis pangiensis*, and *A. bijuga*.—II. "Notes on a Collection of Flowering Plants made by Mr. L. Kitching in Madagascar in 1879," by J. G. Baker. The principal districts in which these were obtained were the northern and eastern slopes of the mountains of Ankaratra, the highest range in the island, at an elevation of 10,000 feet or more. The flowering plants of Madagascar are much less known than are the ferns, though the collections of Bojer, Lyall, and Needer still lie at Kew partially undetermined. Mr. Baker describes two new genera of plants: (1), *Kitchingia* (Crassulaceæ), a succulent perennial glabrous herb, with flexuose stem, numerous opposite sessile or petiolated fleshy leaves, and large bright red flowers in lax terminal cymes. It is allied to *Bryophyllum*, from which it secedes by its small calyx and divergent carpels; (2) *Rhodocodon* (Liliaceæ), a plant with subulate leaves, a slender scape, small red laxly racemose flowers, and peculiar small spurred bracts; it comes between *Muscari* and *Uryinea*. Of sixty species described thirty are new to science.

November 18th.—Robert M'Lachlan, Esq., F.R.S., in the chair. —Lieut.-Col. H. Godwin-Austin was elected a Fellow of the Society. —A paper was read "On a proliferous condition of *Verbascum nigrum*, L.," by the Rev. G. Henslow. This was rceeived from Mr. Marshall, of Ely, and it very closely resembled a malformed plant of *Lysimachia Ephemerum*, described by Baillon ('Adansonia,' tom. 3, p. 310). The upper part was very diffuse, with leafy axes produced from the centres of the flowers. The lower part had flowers with very large ovaries adherent within to arrested proliferous branches. Several kinds of malformation occur amongst those on the upper part, which will be described in the paper itself. The difference between the lower and upper parts may be attributed to the general tendency of the sap to run to the extremities' which will thus account for the development of the proliferous axes above and their arrested state below.—In a second paper read, "Novitates Capensis," by Messrs. P. MacOwan and H. Bolus, the authors have described several interesting new South African plants. Among other novelties are *Ranunculus Baurii*, *Ericinella passerinoides*, *Orthosiphon ambiguens*, and *Herpolirion capensis*, the last a representative of a form hitherto known only from Australia. A third botanical communication was by the Rev. M. J. Berkeley, "On Australian Fungi," principally received from Baron F. von Mueller.

Original Articles.

MUSCI PRÆTERITI:

SIVE DE MUSCIS NONNULLIS ADHUC NEGLECTIS, PRÆTERVISIS VEL CONFUSIS, NUNC RECOGNITIS.

AUCTORE RICARDO SPRUCE.

(Concluded from p. 18.)

8. JUNGERMANIA PEARSONI, n. sp.

Dioica pusilla depresso-cæspitosa luride viridis, facie fere *Cephaloziæ divaricatæ* majoris. Caules 8 mm. longi flaccidi semel bisve (raro pluries) furcati, nullo ramo postico, subæqualiter foliosi, radicellis perraris. Folia dissita—raro subcontigua—transversa, late cuneata, complicato-carinata, ab apice ad $\frac{3}{4}$ usque bifida, carina angulo lato (sub 80°) e caule extante, segmentis suberectis (cauli subparallelis) planiusculis ovatis subacuminatis acutis subobtusisve; cellulæ minutulæ subquadratæ, parum elongatæ, opaculæ vel subpellucidæ, pariete subleptodermi, cuticula vix asperula. Hypophylla nulla, vel raro unum alterumve, subulato-lineare, caulis apicem versus. Andræcia medio caule ramove posita; bracteæ pauci- (3–4-) jugæ, foliis consecutivæ, majores, confertæ, basi turgida pellucida interdum dente antico incurvo auctæ; antheridia solitaria magna longi-stipitata. Folia $\cdot 2 \times \cdot 17$, $\cdot 15 \times \cdot 15$; cellulæ $\frac{1}{6\frac{1}{4}}$ mm.

Hab. Wet rocks on Glyder Vaur, North Wales. (W. H. Pearson, May, 1877). Planta mascula sola adhuc lecta.

Huic proxima est J. OPACULA, n. sp., meipso in saxis terra obtectis ad pedem montis Chimborazo austro-orientalem, alt. 2600 m. lecta, magnitudine, colore et ramificatione bifurca conveniens, diversa tamen foliis ad $\frac{1}{2}$ solum bifidis, magis obscure carinatis, segmentis semper obtusis subdivergentibus, cellulis eadem magnitudine vero valde chlorophyllosis. Altera species peraffinis videretur *J. intricata*, L. et G., Syn. Hep.; Gottsche Mex. Leverm., t. 18, cum *J. Pearsoni* habitu, "colore foliorum fusco-atro, summorum novellorum viridi-flavo," et foliis erectilobis conveniens; diversa autem foliis subquadratis ad $\frac{1}{2}$ solum fissis, lobis subobtusis. Hujusce speciei habuit ill. Gottscheus perianthia perfecta, terminalia, brevi-cylindracea, os subconstrictum versus obtuse 3- (4-) plicata. Bracteæ ♀ foliis paulo majores sed perfecte conformes—neque plurilobæ nec denticulatæ. *J. rigida* Lindb. Botaniska Notiser, 1872, mihi nondum visa, e descriptione haud longe aliena erit, colore et ramificatione eadem fere, diversa foliis confertis rigidis cymbiformi-concavis vix ad $\frac{1}{2}$ usque bilobis.

This curious little plant, which I venture to dedicate to its indefatigable discoverer, might be passed over for a large form of *Cephalozia divaricata*, but is at once distinguished from that and every other species of *Cephalozia* by the forked, or lateral and axillary, branching, and the entire absence of the postical branches characteristic of *Cephalozia*. From *Marsupella* (*Sarcoscyphus*) it differs in wanting the rhizomatous base, in the ramification, the deeply cloven leaves and their texture, and (so far as I have seen) in the absence of oil-granules from the cells. As we have only the male plant, which has monandrous bracts, its place among other bifid-leaved *Jungermaniæ* is not easy to assign. It is not unlike small forms of *J. minuta*, Schrad., and *J. rigida*, Lindberg; but its nearest allies are doubtless the two with which I have above compared it, viz., *J. opacula*, n. sp., gathered by myself in the Andes, between Riobamba and the Plateau of Chimborazo, on rocks shattered by the great earthquake of 1796; and *J. intricata*, Lindenb. et G., found by Liebmann in Mexico, near Oaxaca, where it grew closely interwoven with *J. colorata*.

9. Lepidozia Pearsoni, n. sp.

Dioica, reptans, e pallide viridi fulva. Caules 2–3 pollicares subteretes, cellulis pluristratis, corticalibus paulo majoribus, conflati, flaccidi, furcati simplicesve, dein laxe pinnati; ramis brevibus inæquilongis simplicibus—rarissime ramulosis, aliis apice flagellari microphyllo vix radicantibus; radicellæ cæterum tam ad caulem quam ad flagella perraræ vel fere mullæ. Omnes rami pro more laterales, axillares, plures apice masculi; rarissime advenit stolo posticus, ex parte foliosus, interdumque ramosus, vel florescentia postica amentiformis. Folia parva, caulina pro more distantia, rarius subcontigua, oblique incuba, subquadrata, ultra dimidium palmatifida; laciniis plerumque 4, rarissime 5 vel 6, subulatis subacuminatis, incurvo-uncinatis, basi 3–5 cellulas latis, duabus mediis cæteris latioribus, postica breviore; cellulæ mediocres subquadrato-hexagonæ, paulo elongatæ, subpellucidæ, pariete ad angulos parum incrassato. Folia ramea minora, 3–4-fida—superiora solum bifida; foliolis 3–4-fidis. Folium ad ramorum originem cæteris longius et angustius, profunde bifidum. Foliola (s. hypophylla) foliis sat breviora, fere æquilata, ad ½ fissa, laciniis 4 vel haud raro 5, rarius 6, late subulatis obtusis incurvis. Flores dioici: ♂ spicati, rami apice tenui—rarissime basi—tenentes; bracteæ 3–10-jugæ, foliis paulo minores, imbricatæ concavæ bilobæ, raro dente antico basali auctæ, lobis ovatis acutis incurvis; bracteolæ angustiores bilobæ. Antheridia solitaria maxima brevissime stipitata. Planta ♀ adhuc nobis incognita. Folia ·55 × ·45, laciniæ mediæ ·35 mm. longæ; cellulæ $\frac{1}{30}$; foliola ·3 × ·4; bracteæ ♂ ·4 mm.

Syn. "*Lepidozia reptans*, L." Carringt. et Pears. Hepat. Brit. exsicc. fasc. 1, no. 37 (1878).

Hab. Tyn y-groes, near Dolgelly, N. Wales, loosely creeping among other *Hepaticæ*, especially *Diplophyllum albicans*, and mosses. (W. H. Pearson, May, 1877).

Florescentiâ masculâ normaliter ramum lateralem terminante —rarissime ramulum proprium posticum sistente—inter *Lepidozias* singularis et valde distincta species. *L. reptans* certe distat habitu robustiore; colore (in vivo) saturate viridi, in sicco cærulescente; caule breviore magis ramoso; foliis subimbricatis ad $\frac{1}{2}$ solum fissis, laciniis latioribus (basi 4–7 cellulas latis), cellulis subopacis tam latis quam longis; foliolis solum 3–4-fidis, segmentis acutis; *florescentia monoica*, mascula amentum posticum semper sistente. Adsunt tamen *Lepidoziæ* exoticæ *L. Pearsoni* affiniores; tales sunt *L. microphylla*, Lindenb., *L. trichodes*, Nees, præcipueque L. *filamentosa*, L. et L., Spec. Hep. 36, t. 6, ex America boreali-occidentali (et insulis Aucklandicis ?) nostræ quoad habitum magnitudinemque sat similis, diversa autem foliis ad dimidium solum fissis, laciniis paucioribus (plerumque 3, nec 4–6).

10. Lejeunea ulicina, *Tayl.*

Jung. ulicina, Tayl., in Trans. Bot. Soc. Edinb. 1841, p. 115.

Minuta viridis laxe effusa, raro subcæspitosa, sæpe supra muscos reptans. Caules $\frac{1}{4}$—$\frac{1}{2}$ poll. longi, stricti (nec geniculati) vage ramosi, subradicellosi. Folia dissita vel subcontigua, rotundo-ovata cochleato-concava, apice sensim angustata obtusa vel abrupte acuta, lævia vel e cellulis convexulis obscure tuberculosa, a basi ad $\frac{1}{2}$—$\frac{3}{4}$—raro ad apicem fere usque obtuse complicata; lobulus lobo plus minus brevior angustiorque—raro fere æquilatus, ad plicam turgidus, margine incurvo vel sæpe plano, apice apiculato-acuto; cellulæ minutulæ subæquilateræ, chlorophyllo parco subpellucidæ, pariete ad angulos vix incrassato. Foliola distantia foliis triplo breviora ovalia ultra medium bifida, segmentis lineari-subulatis, inferne 2 cell. apice solum 1 cell. latis, sinuque subobtusis. Flores dioici: ♀ terminales, innovatione hinc vel utrinque suffulti. Bracteæ maximæ, foliis subtriplo majores, ad angulum 60°—90° inter se divergentes, ab apice ad medium fere bifide, complicatæ, ad carinam anguste alatæ, lobo antico semiobovato acuto, lobulo breviore—raro æquilongo—semilanceolato vel oblique cuneato, margine celluloso-erosæ interdum subdenticulatæ; bracteola paulo brevior erecta, oblonga vel ovali-lanceolata, ad $\frac{1}{4}$ usque acute bifida, segmentis acutis. Perianthia (vix matura) involucro inclusa, pyriformi-oblonga obovatave, apice depresso vix umbonulata, teretia nisi apicem versus in carinas 5 valde obtusas prominula, cellulis convexulis parum papulosa vel fere lævia. Cætera haud visa. Planta ♂ adhuc desideranda. *Folia* ·15×·08, ·2×·15; *c.* $\frac{1}{6}\frac{1}{0}$; *foliola* ·05—·10; *bract. lob.* ·4×·2, ·5×·3; *bracteola* ·3×·15; *perianthia* ·35—·4×·18 mm.

Jungermania minutissima, Hook., Brit. Jung. t. 52, ex parte (nec Smithii).

Lejeunea minutissima, Spruce in Ann. Nat. Hist. et Trans. Bot. Soc. Edinb., 1849 (nec *J. minutissima*, Sm.)

Hab. per totam fere Europam temperatam, ad arborum corticem et supra muscos; in Hibernia australi-occidentali præcipue vulgaris, sæpeque *L. minutissima* consociata. Killarney in cortice, in primis *Pini sylvestris*, *Callunæ* et *Ulicis* (Taylor, Spruce, etc.); supra

Frullaniam dilatatam (Carrington); supra *Fr. Tamarisci*—forma pulchella, flore ♀ semper dichotomiali, *i. e.*, innovationibus duabus oppositis suffulto (Wilson in hb. Hook.) Anglia: Bolton Abbey, Wharfedale, supra *Neckeram crispam* parasitans—forma luxurians, fol. majoribus (R. S.) Levens Park, Westmorlandiæ, in cortice vetusto (G. Stabler). Ex aliis plurimis locis Insularum Britannicarum et Galliæ occidentalis habemus, semper autem plantam ♀ solam, sterilem et sine perianthiis; nisi prope Vire Normandiæ ubi cæspitem perianthia vix matura ferentem—nunc in herbario Schimperiano ad Kew conservatum—cl. Brébisson (ut videtur) legit. Plantam ♂ adhuc frustra quæsivimus.

A *L. ulicina* longe diversa est *L. minutissima*, Sm. (*vera* E. Bot. t. 1633, a. 1806 = *Jung. inconspicua*, Raddi = *Lejeunea Taylori*, Spruce), florescentia monoica, absentia foliolorum completa (imo e flore fœmineo); caule geniculato-flexuoso; foliis minoribus distantibus ad caulis genua insertis, tota fere longitudine complicato-concavis; radicellis (dum adsint) cuique folio—neque solum alternis foliis—tributis; bracteis minoribus, ad carinam exalatis; perianthiis turbinatis argute 5-carinatis, carinis plerumque cellulis exstantibus uniseriatis pellucidis moniliatis.

In America tropica plures *Lejeuneas* minutas legi, *L. ulicinæ* arctius affines quam *L. minutissima*. Talis est *L. bullata*, Tayl.! (in sylvis Andium subalpinis) a *L. ulicina* diversa foliis minoribus distantibus, totis fere convoluto-conchoideis, cellulis præminutis; foliolis minutis caule absconditis; bracteis exalatis; perianthiis pyriformibus alte 5-carinatis. Alia species vicina est *L. perpusilla*, Spruce (in m. Azuay lecta) foliis ovato-triangularibus subacutis, lobulo minore; foliolis pro ratione multo minoribus; bractearum lobo falcato-rhomboideo, &c. Alia *L. aphanes* Spruce (in truncis fl. Casiquiari inundatis), colore fulvo; foliorum lobulo sat minore, cellulis solum parvis; foliolis minutissimis (foliis 7-plo minoribus); bracteis foliis minoribus exalatis; perianthiis obovatis altiuscule 5-carinatis. Paucæ species tropicæ, facie nostræ sat similes, monoicæ sunt. *L. diversiloba*, Spruce (prope Killarney inventa) foliis majoribus planioribus suberectis, obovato-oblongis vel sublingulatis, lobulo sat minore vel persæpe deficiente, facile distincta est.

I introduce this species, partly for the sake of describing the perianth, hitherto unknown, which I have found in the herbarium of the late Professor Schimper (now in the possession of the Royal Gardens at Kew), on a specimen marked "*Jungermania minutissima*, Sm. Prope Vire," without the collector's name, but apparently in the handwriting of the late M. de Brébisson; my chief motive, however, is to correct a mistake into which I unwittingly fell, many years ago, and which has been the cause of misleading others.

When, after Sir J. E. Smith's decease, Sir W. J. Hooker, at Sowerby's request, undertook to edit a series of supplements to 'English Botany,' he associated with himself Mr. Borrer, for the Lichens, and for certain critical genera of flowering plants, notably *Rubus* and *Salix*. Hooker, after a while, finding the task interfered with his more important publications, resigned it entirely

into Borrer's hands, who thereupon sought the aid of W. Wilson, for the Musci and Hepaticæ. When Borrer entered on the office of editor, Sowerby gave to him portions of the original specimens of many of the Cryptogamia he had figured in Eng. Bot.; and when I visited him at Henfield in the spring of 1846 he allowed me to examine those specimens, and gave me a scrap of a few that were divisible. Among the latter was *J. minutissima*, Sm., E. Bot. t. 1633. I examined it, and found it exactly what Taylor had called five years before *J. ulicina*. The specimen is now before me, and it is indisputably Taylor's plant. At that time Borrer, and especially Wilson, considered the testimony of an *authentic* specimen supreme, however much it might vary from the author's own account of it; and Wilson would rarely name a moss unless after comparison with a specimen from the author himself. I, as a young botanist, could only follow the example of my elders; and therefore, on the faith of Sowerby's specimen, reduced Taylor's *J. ulicina* to *J. minutissima*, Sm.; and for the other "*J. minutissima*," which differed from Sowerby's specimen in the monoicous inflorescence, the absence of underleaves (or stipules), and the smaller bracts, very shortly cloven, and not winged at the fold,—I coined the name *Lejeunea Taylori*.

Sowerby's figure represented *J. minutissima* in fine fruit. We had never seen the fruit, or even the perianth of *J. ulicina*, but only the ♀ involucres; yet we hoped fruit might be found, and there was no *à priori* reason why it should not correspond to Sowerby's figure. In truth, I paid too little attention to that figure, considering the evidence of Sowerby's specimens all-sufficient. But when, a few years ago, I came to study the genus *Lejeunea* in its entirety, for the sake of the South American species, and found that after more than thirty years the perianth of *L. ulicina* was still unknown, I procured the Eng. Bot. figure of *L. minutissima*, and, comparing it closely with Sowerby's specimen, I became convinced that the figure never could have been made from that specimen. The figure does not reproduce *J. minutissima* very accurately, especially as to the stem and branches, which are shown straight, instead of zigzag (as they ought to be), although there is a slight hint of the latter in the lowest magnified figure (of a portion of a stem, with two leaves *in situ*). The stipules, if present, might have been overlooked; but the fact alone of the plant being in fruit assures us that it could not be *J. ulicina*. The sharp keels of the perianth are shown clearly enough, and contrast well with the almost ecarinate perianth of *J. ulicina*, now that we have been able to compare the two.

Hooker's 'British Jungermanniæ,' being founded on far more accurate observation and fuller knowledge of the tribe than either Smith or Sowerby could pretend to, was naturally most relied on by students; but his figure of *J. minutissima* was very puzzling, for it showed a fertile plant without stipules, and a portion of a barren stem possessing them. We can see now that he must have had before him specimens of both species, and have failed to distinguish them. It is very usual to see the two species growing inter-

mixed; I have myself gathered them thus, and they are associated in the majority of the specimens in Sir W. Hooker's herbarium, especially in those from Killarney, and from Devon and Cornwall.

Dr. Taylor showed me in his herbarium a bit of furze-stem, gathered near Dunkerron, which had growing on it *six species* of *Lejeunea*, viz., *L. serpyllifolia*, *L. ulicina*, *L. ovata*, *L. hamatifolia*, *L. minutissima*, and *L. microscopica*, i. e., all the Irish species of *Lejeunea* known to him except *L. echinata* (=*L. calcarea*). The multitude of Hepaticæ that grow intermixed—or partly parasitic on one another—upon living leaves, in tropical countries is truly surprising. I thought it a wonderful thing when I found in the Peruvian Andes *seven species of Lejeunea* growing on a single pinnule of an *Acrostichum*; but I afterwards found in the *Cinchona* forests on the western slope of Chimborazo a large leaf of a nutmeg-tree so completely and thickly clad with *Lejeuneæ*, &c., that it took me (some years afterwards) a couple of days' close work to disentangle and separate the species. They comprised twenty species of *Lejeunea*, most of them in perfect state, and a few of them never found elsewhere by me; besides a pretty *Dendroceros* in good fruit; two or three species each of *Metzgeria* and *Plagiochila;* and seedlings of other Hepaticæ. If I had given a clipping from that leaf, in the name of a *Lejeunea* that certainly grew on it, but intermixed with other species, it might have been impossible for the recipient to know which was the particular *Lejeunea* meant. The *Jungermaniæ* of temperate climes, growing often on moist earth, with which they are partially encrusted and obscured, are often difficult to separate by the eye alone, or with an ordinary lens, from allied species that grow intermixed, especially if the leaves are apt to curl up in drying. *Jungermania bicrenata*, Lindenb., and *J. capitata*, Hook. (= *J. intermedia*, Lindenb.)—two closely-allied but really distinct species—often grow intermixed. It was thus I most frequently saw them in the Pyrenees, and although I succeeded in distinguishing them, it was with difficulty. I had noticed a peculiar odour in a patch of fresh, or moistened plants, and I attributed it to both species; but Dr. Gottsche showed me that *J. bicrenata* alone was sweet-scented, and that by this character it was most readily separated from *J. capitata*. In this country also they sometimes grow together, and Mr. Slater has lately found at Gothland, near Whitby, the two species mixed in the same patch in a very bewildering fashion. There is little doubt that Dickson's *Jung. excisa*, Crypt. iii., t. 8, f. 7, was compounded of these two species, and of a small form of *J. ventricosa* (which often grows with the other two, especially where the habitat is rotting wood). His description may apply to any or all of the three; his figure is almost certainly *J. bicrenata* (as is also Martius's figure of *J. excisa*, Fl. Erlang., t. 5, f. 42); and the specimen in his herbarium is (according to Lindberg) *J. capitata*. But they who rely on the testimony of specimens should consult those given by Dickson, for his "*Jung. excisa*," to Hooker and Taylor (and possibly to Greville). I have not done so, but I have reason to believe them partly the small variety of *J. ventricosa* figured by Hooker as *J. excisa*, Brit. Jung. t. 9. These

specimens are assuredly quite as *authentic*—as much derived from the author's own hand—as the specimen preserved in his own herbarium; and for this very adequate reason. The older botanists—indeed up to the period of my youth—rarely preserved the actual stems, &c., of a moss (but especially of a liverwort) they had described or figured. Dissections were mostly thrown away after examination. In Hooker's herbarium the specimens are mostly glued down, and there is rarely any indication of the particular specimen from which the plant figured in 'British Jungermanniæ' had been taken, or any loose stems (in packets) which might presumably have served that purpose. Even where we know, from the locality, or from some incidental reference in the text, the exact specimen from which the type-plant was taken, if that plant has disappeared the remainder of the tuft may consist entirely of other species.

Dillenius's specimens can rarely have undergone any dissection, for he had no microscope (to our great loss!) Yet the actual plant, or portion of a tuft, figured by him may in some cases have been thrown away, and it is by no means certain that that portion of it preserved in his herbarium is always the identical species figured. Here is a crucial instance. The *Jung. multiflora* of Hudson, Fl. Angl. 510, is indisputably what we now call *Lepidozia setacea* (Web.); his phrase "frondibus simpliciter *pinnatis bási floriferis, foliolis setaceis*," followed by the synonym from Linnæus (Mant. ii.) "*Jung.* fronde repente ramosa, *foliolis alternis geminis setaceis* æqualibus" proves this. Nor is the synonym quoted from Dillenius (Musc. 481) "Lichenastrum multiflorum *exile, foliis angustissimis*," opposed to the conclusion that it refers to the same species. Yet Dillenius's figure, t. 69, f. 4, is plainly *Jung. bicuspidata*, L.—no one who looks at it with unbiassed eyes can ever make it anything else; and the specimen corresponding to it in his herbarium is, according to Hooker and Lindberg (who had both examined it) *Jung. connivens*, Dicks.! This is an extreme case, where description, figure, and specimen all contradict one another; and yet I can easily comprehend how the confusion may have arisen, for in a peat-bog near to where I am writing, the three species, *J. bicuspidata*, *J. connivens*, and *J. setacea*, grow intermixed, and the first two are not easily distinguished without microscopical examination. The third is distinct enough, almost to the unassisted eye, yet often adheres by its radicles so firmly to the other two as to seem organically connected. I suppose Dillenius to have had such a tuft, of the three species combined; but, however that may have been, it must be conceded that no number of specimens of *J. connivens* preserved in his herbarium can justify us in quoting his Tab. 69, f, 4 for that species; and such seems also to have been the opinion of Hooker.

Hudson and other writers on Cryptogamia immediately following Linnæus were often loose and inaccurate in their quotations from pre-Linnean authors; *e.g.*, Hudson quotes for his *J. quinquedentata*, Micheli, t. 6, f. 2, yet Micheli's figure is plainly *J. trilobata*—a species with incubous tridentate leaves, while the leaves of

Hudson's plant are succubous. But for *J. trilobata*, L., he quotes Mich., t. 5, f. 10—the figure of a *Fossombronia*, apparently *F. angulata*. References such as these were obviously mere guesswork, and many more might be cited.

From all that precedes it may readily be understood how "false" specimens of Hepaticæ abound in herbaria. I have during the last nine years examined a great many *authentic* specimens of Hepaticæ, from all parts of the world, and in the whole number about *one in every three was not genuine*.* Wherefore, considering how often I and others have been misled by the evidence of so-called "authentic specimens" of this family, I am compelled to refuse absolutely to receive any such evidence where it is contradicted by the author's published descriptions. This is not to despise the valuable aid a genuine and original specimen (where it is really such) may afford in settling the claims or the synonymy of a disputed species, but only to fall back on the example of Linnæus, who desired that his species might be recognised from his published descriptions, rather than by the specimens that might exist under the same name in his herbarium.

NOTES ON THE HERBARIUM OF ABBOT,

WITH REMARKS ON THE SYNONYMY OF SOME OF THE SPECIES.

By R. A. Pryor, B.A., F.L.S.

Through the kindness of Mr. W. Hillhouse, at that time of Bedford, I had not long since the opportunity of looking through the herbarium of Abbot, which is preserved at Turvey Abbey. The collection has been described in glowing terms in the preface to the 'Flora Bedfordiensis,' where it is stated to be "the admiration of all who have knowledge and judgment to discern its superior beauty and excellence," and to have been prepared by the "amiable and interesting partner of his pursuits and labours." "But this," the writer goes on to observe, "is only one of the innumerable obligations for which he is proud to acknowledge himself indebted to her assiduity and attachment," and it seems not improbable that the "fair associate" in question was accustomed to expect or even to insist upon such public exhibitions of deference and gallantry. Be this as it may, the language employed by the excellent author of the Flora, to which this herbarium was designed to be a companion, is calculated to excite our interest in no common degree; the expectations he has raised, however, will not be found to stand the test of examination.

The collection is contained in five folio volumes; owing, however, to the immaturity and fragmentary condition of a considerable

---

* Even among true mosses, an author's own specimens are not always to be relied on (as Wilson himself had frequently to confess in his latter years); yet they much more rarely grow intermixed than liverworts, and where a patch does consist of two or three species, they are nearly always separable by the eye alone. As with liverworts, so with mosses, no authentic specimen can be received in evidence which contradicts the author's description in its most essential characters.

number of the specimens, many of which are mere tops and scraps quite impossible to determine, and the complete absence* of any indications as to the localities in which they were gathered, their value is very much diminished for critical purposes.

Thus it cannot be certain that any one specimen was collected within the limits of the county which the herbarium professes to illustrate. Still we may be justified in assuming that it represents, on the whole, Abbot's own ideas of the species he has enumerated in his Flora, and, with the necessary reservations, it may fairly be used to throw at least a side light on disputed points in the text.

In the following notes I have, I believe, marked all errors or uncertainties of name, and have noticed the frequent instances in which specimens—and that is the case unfortunately in many of the more interesting and critical genera—are altogether absent.

The names first given are taken from the sheets of the herbarium, and notice has been taken of any discrepancy between them and those employed in the Flora. It has been thought unnecessary to mark the absence of the very common and universally known species.

Callitriche verna. The specimen is a mere scrap, but with ripe fruit; this has the erect styles and bluntly rounded edges of *C. obtusangula*, Le Gall. The figure quoted has been usually taken to represent *C. platycarpa*, Kuetz. It would be desirable for some resident botanist to search the ditches in the neighbourhood of Ford End.

C. autumnalis. Without fruit, and too young for determination, but looking more like *C. vernalis*, Kuetz., than *C. hamulata*, Kuetz.

Veronica agrestis. *V. polita*, Fr.

Valeriana officinalis. The true upland plant, *V. Mikanii* of Syme. Is not this *V. procurrens*, Wallr. ?

V. Locusta. *Valerianella dentata*, Poll., the variety with hairy fruit, *β. lasiocarpa* of Koch.

Agrostis capillaris. *A. vulgaris*, With.

Poa angustifolia. *P. nemoralis*, L.

P. nemoralis. The specimen is not altogether determinable, but is suggestive rather of the larger forms of *P. compressa*, L.

P. retroflexa. *P. distans* of Flora; *Glyceria distans*, Whlnb.

Festuca rubra and *F. duriuscula.* Indeterminable.

F. ovina. Does not well represent the typical plant, as figured in E. B. 585.

F. fluitans. Exactly *Glyceria pedicillata* of Townsend, as might have been inferred from the reference to the "admirable figure" of Curtis. The plate quoted from the 'Flora Rustica' apparently represents the same thing. In the last edition of the 'Manual,' Professor Babington has removed *G. pedicillata* as a variety from *G. plicata*, Fr., and placed it under *G. fluitans*, Br., and in this may perhaps have been influenced by Fries' reference to Curtis

* There are a few specimens from correspondents with the usual records of date and locality, but in no case, I believe, do these refer to Bedfordshire plants. The great majority of Relhan's specimens were in the same condition. See Bab. Fl. of Camb. p. 5.

under his *G. fluitans festucacea* (Mant. ii. p. 7). It seems not improbable that some other of the forms described by Fries may occur in England.

Arundo Calamagrostis. *Calamagrostis Epigeios*, Roth.

A. Epigeios. *C. lanceolata*, Roth.

These are not errors of determination, but the mistake arises, as in other cases, from following the accepted nomenclature of the time. In this instance the confusion is increased by a reference to the erroneous, as originally issued, figures of 'English Botany,' t. 403, representing *C. Epigeios* under Hudson's name of *Arundo Calamagrostis*, whilst t. 402, to which Abbot refers under *A. Epigeios*, the name originally affixed to the plate, is a figure of *Phalaris arundinacea*, L., the *Arundo colorata* of Solander, and the 'Flora Britannica.' The matter was set right at a later period (v. E. B. 2159).

Montia fontana. *M. minor*, Gm.

Galium palustre. The genuine plant. Another specimen has been labelled *G. anglicum.*

G. procumbens. *G. saxatile*, L.

G. Mollugo. The ordinary large plant, *G. elatum*, Th.

G. erectum. *G. elatum*, a smaller plant than the last.

G. pusillum. A weakly lateral shoot from the lower part of the same form as the last.

Cuscuta europæa and *C. Epithymum* are correctly named. I have seen also specimens of the former gathered at Flitwick, in 1841, by the late Rev. R. H. Webb.

Potamogeton compressum. No specimen.

Sagina apetala. The specimen looked not unlike *S. maritima*, Don.

Myosotis scorpioides ; M. arvensis of Flora. *M. intermedia*, Lk.

Symphytum patens. The wild waterside plant, which may, however, be quite distinct from *S. officinale*, L.

Primula elatior. A hybrid or intermediate form, probably *P. vulgari-officinalis*, Gr., not of course the true *P. elatior* of Jacquin.

Anagallis cærulea. Petals without glandular hairs.

Chenopodium urbicum. The usual form (*C. intermedium*, M. & K).

C. serotinum. No specimen.

C. album. *C. viride*, Angl.

C. viride. *C. paganum*, Reich.

Ulmus campestris, U. effusa. No specimens.

There has always been some degree of uncertainty as to the proper names of the two species of elm which occur in Britain. The indigenous tree has usually been recorded as *U. montana* of Smith, and it so stands in many of the continental Floras. The earliest name is, however, *U. glabra* of Hudson (Fl. Angl. ed. i. p. 95—1762), and if we may rely on his citation of the unmistakable figure of Johnson (Ger. Em. 1481, 3), which is the original authority for his species, and for the *U. montana* of all subsequent writers, there could be little room for doubt in the matter. The uncertainty is, however, owing to the use of the words "cortice glabro" in the specific character; and on that account Stokes, in

the second edition of Withering's arrangement (p. 259, 1787) altered the name to *U. montana*, and added a note that the bark of the trunk was rough. It is not altogether clear what Hudson may have intended by this expression, but the boughs of the Wych Elm, although occasionally corky, are in general much smoother than those of the other species, as has been noticed by most writers on the subject (*e. g.*, "branches not corky, cinereous, smooth."—Lindley Syn. p. 227). Should, however, Hudson's name not be accepted, the priority clearly rests with that of Stokes, who described and named the species a dozen years before the appearance of the 'Flora Britannica' of Smith,* who indeed quotes Withering as his authority; while Lindley's adoption of *U. montana*, Bauh., in which he is followed by the 'British Flora,' is in defiance of all rule.

With regard to the other *Ulmus*, it is now pretty generally agreed that *U. campestris*, Sm., does not represent the original species of Linnæus, which probably was intended to include all the European elms, and has no especial reference to a tree which does not occur in Sweden. Still less can *U. suberosa* of Ehrhart be legitimately employed to denote a species which is excluded from his definition by the primary, or rather only character,† the corky bark being altogether absent in typical examples of the small-leaved elm. It is true that Willdenow has defined the var. of his *U. suberosa* as with "ramis lævibus," the lower ones only "e trunco vel radice ortis" being "alato-suberosis" (Willd. Sp. v. i. p. 1324); but this is a considerable departure from the original idea of Ehrhart, and is hardly consistent with the phrasing of his own character "cortice ramulorum suberoso-alato." Were either the species of Smith or Willdenow original creations, there could be no objection to their nomenclature, but in each case there has been a misapplication of a prior name (supposing Willdenow to have understood by his *suberosa* the same species as Smith by his *campestris*, and otherwise his application of it is nothing to the point), and their authority is in this instance undeserving of the respect which has been so generally accorded to it. Dr. Stokes, however, in his 'Botanical Materia Medica,' has described and named afresh the elm "seminaturalised in Britain," with "seeds rarely if ever ripening" and "roots throwing up suckers," as *U. surculosa* (Stokes, *l. c.* v. ii. p. 35, 1812). He gives an excellent account, with full references and notes as to the distribution of both species, and it is strange that the work of so accurate and painstaking a botanist should have been so much overlooked.

Gentiana campestris. No specimen.

The specimen of *Bunium flexuosum* had been originally ticketed as *Bulbocastanum.*

---

* As an instance of Smith's careful animus in small matters take his note, E. B. 2161 :—"We ought at *U. montana*, t. 1887, to have quoted Sm. Fl. Brit. 282 after Bauh. Pin. 427;" and therefore *before* the reference to Withering.

† The sole distinction between the characters of *U. nuda* and *U. suberosa*, Ehrh., resides in the "ramis numquam suberosis" of the former, and "suberosis" of the latter. Cf. Willd. Sp. v. i, p. 1324.

Sium repens. No specimen.

Oenanthe peucedanifolia. Probably *Oe. silaifolia*, Angl. Nyman, in his 'Conspectus,' has again referred the British plant to *Oe. peucedanifolia*, Poll., and restricts *Oe. silaifolia*, M. B., to the south and south-east of Europe. A specimen of *Oe. Lachenalii*, Gm. (not in the Flora), has been labelled *Sison verticillatum*.

Phellandrium aquaticum. *Oenanthe Phellandrium*, Lam., and not *Oe. fluviatilis*, Colem., which, however, does occur in the county.

Cicuta virosa is correctly named.

Pimpinella dissecta. The cut-leaved form of *P. Saxifraga*, L., and not that of *P. major*, Huds.,* which has since been found in the county.

Drosera longifolia. No specimen. *D. anglica* is correctly named.

Juncus articulatus. The name has been altered from *compressus*. The specimen is almost certainly *J. lampocarpos*, Ehrh., to which indeed Smith (E. B. 2143) has referred Abbot's plant, in spite of the latter's quotation of his own earlier figure (E. B. 238). He may not improbably have seen Bedfordshire specimens. It seems rather curious that Sir J. D. Hooker, in the 'Student's Flora,' should look upon *J. silvaticus*, Reichard,† as especially the *articulatus* "proper" of Linnæus, in opposition to the opinion of almost all other botanists, and in the teeth of the Linnean character, "*petalis obtusis.*" (Sp. Pl. 465.)

J. bulbosus. *J. supinus*, Mœnch.

(A specimen labelled *J. acutus* is *Scirpus maritimus*, L.)

J. silvaticus. *Luzula vernalis*, DC.‡

J. pilosus. Same as the last.

Rumex sanguineus. No specimen.

R. acutus, β. *R. conglomeratus*, Murr.

Alisma Plantago. The usual plant with cordate leaves.

Epilobium angustifolium. The garden escape, *E. brachycarpum*, Leight.

E. tetragonum. The restricted plant.

E. palustre. Correctly named.

Polygonum minus. No specimen.

Stellaria media. The principal specimen is correctly determined, *S. palustris*, Ehrh., Retz.§; but an example of *S. graminea*, L., has been afterwards added.

Arenaria serpyllifolia. The restricted plant.

Sedum Telephium. *S. Fabaria*, Koch.

Cerastium vulgatum. *C. triviale*, Lk.

C. viscosum. *C. glomeratum*, Th.

C. semidecandrum. Error of name.

---

*P. major, Huds., Fl. Angl. 110 (1762). *P. magna*, L., Mant. ii. 219 (1771).

† *J. silvaticus*, Reichard, Fl. Mœn.-Fr. ii. 181 (1778); *J. acutiflorus*, Ehrh. Beitr. vi. 82 (1787—92).

‡ *Luzula vernalis*, DC. Fl. Fr. iii. 160 (1805). *L. pilosa*, Willd. Enum. 393 (1809).

§ *S. palustris*, Retz. Prodr. Fl. Scand. ed. ii. n. 548 (1795). *S. glauca*, With. Arr. ed. iii. p. 420 (1796). *S. media*, Sibth. (fl. ox. p. 141 (1794). is inadmissible, as it had been previously employed for another species of the same genus.

C. pumilum. No specimen.
Spergula arvensis. *S. vulgaris*, Bngh.
S. pentandra. No specimen.
Prunus Cerasus. No specimen.
Papaver dubium. *P. Lecoqii*, Lmt.

An unnamed specimen of a *Thalictrum* (vol. iv., no. 184) seems to be precisely the Hertfordshire plant from Royston Heath. This —from the compressed 10-ribbed achenes, not at all ovoid, but "gibbous above within, and below without," the divaricated branches of the petioles, the reflexed auricles of the stipules, and the striate stem (which is, however, compressible, at least when dry) leafy all but to the very base—is certainly, I believe, the *T. majus* of the 'Student's Flora,' and the *T. flexuosum* of the sixth edition of the 'Manual.'* It seems safest to follow Nyman in referring it to *T. Jacquinianum*, Koch. (Syn. ed. ii. p. 5 and 1015, 16), the description of which applies in all particulars, while there seems to be some doubt as to the precise plant of Bernhardi, nor are Reichenbach's figures altogether satisfactory. Mr. Webb's examples from Flitwick (Journ. of Bot. 1876, v. 26) are probably the same thing, and it is perhaps possible that Abbot's plant was gathered in the same locality. Hertfordshire specimens from a new locality, recently collected by Dr. E. de Crespigny, have, however, been named, I know not on what authority, *T. montanum*, Wallr., a form which has usually been placed under *T. minus*, L., Sm.

Ranunculus hirsutus. *R. sardous*, Crantz, Stirp. Austr. fasc. ii. p. 84 (1763); *R. hirsutus*, Curt. Fl. Lond. f. ii. t. 40 (1778)†; *R. philonotis*, Ehrh. Beitr. 1788, ii. 145. The identification of Curtis's plant with the *R. sardous* of Crantz is, I believe, owing to the research of M. Aug. Gras (Bull. Bot. 1862, p. 324), and has been accepted by Grenier (Fl. de la Chaine Jurassique, p. 21), and Nyman in his 'Conspectus.' I subjoin Crautz's original description:—"*Ranunculus sardous.* *R. foliis* radicalibus apii trilobis, fructu rotundo. *R. palustris* apii folio lanuginosus. C. B. Pin. 180. *R.* II. species vel *sardous.* Cordi Hist. fol. 119. *R. secundus*: Camer. epit. 381. Icon. *R. secundus.* B. in Matthiol. fol. 458. Abundat tota Austria. Observatio I. A *Ranunculo sclerato* differre lanugine, pluribus foliorum incisuris, jam C. B. monuerat; hæ differentiæ Linnæum non movere, debuissent tamen circumspectiorem reddere: fructus, qui in priore oblongus, tactus impatiens, elasticus dissilit, in hoc rotundus, seminibus compressis, simpliciter apice acutis, in capitulum collectis visitur. Calyces lanuginosi, colorati, reflexi, flos parvus, gummeo nitore splendens, exiguo ungue maculatus. Obs. II. Semina in plerisque ranuncalis apicem habent reflexum, semen in

* I look upon *T. saxatile* of the 'Manual' as an altogether imaginary plant.

† It has usually been held that Curtis commenced his great work in 1777, but in a MS. note of Pulteney's, in his copy of the first edition of the 'Flora Anglica' of Hudson in the library of the Linnean Society, it is stated that "the first no. of the 'Flora Londinensis' was published in May, 1775." The date 1777 in the title-page to the first volume is that of the completion of the first Fasciculus. Stokes gives 1776 for the first publication.

nostro *sardoo* habet apicem sursum spectantem; quæ nota præter alias hunc satis ab aliis separat." (Crantz, *l. c.*) The observation on the achenes will be at once understood by a reference to E. B. 1504. In other respects the figure quoted from Camerarius is a sufficiently good representation of our plant. Crantz's name is quoted also, as a synonym, by Koch and Decandolle.

R. hederaceus. *Batrachium hederaceum*, Gray, the form with floating leaves.

R. heterophyllus. Apparently *B. heterophyllum*, Gray, but including also a specimen of *B. aquatile*, Desm.

Teucrium Chamædrys. Correctly named.

Mentha odorata. No specimen seen.

Thymus Serpyllum. *T. Chamædrys*, Fr.

Melissa Calamintha. *Calamintha ascendens*, Jord. This is also the Hertfordshire plant, and has smaller flowers than *C. Nepeta*, Clairv. Cf. the quoted figure from Blackwell.

Euphrasia Odontites. Probably *Odontites verna*, Reich.

Draba muralis. Correctly named. This was not discovered by Abbot until after the publication of his Flora. It seems to have occurred as a casual also on the Continent. (Cf. 'Grenier Flore de la Chaine Jurassique,' p. 62.)

Cardamine hirsuta, *C. parviflova*, and *C. flexuosa*, With.

Erodium moschatum. No specimen. The E.B. figure was, however, as in the case of *Draba muralis*, drawn from a plant sent by Abbot.

An unnamed specimen of *E. commixtum*, Jord., probably represents *E. pimpinellæfolium* of the Flora. Should not Sibthorp's name be kept up for this plant?

(To be continued.)

A NEW HONG-KONG *MELASTOMACEA*.

By H. F. Hance, Ph.D., &c.

Amongst a number of new plants which Mr. Charles Ford, the able and energetic Superintendent of the Hong-Kong Botanic Gardens, has within the last few years detected, one of the most interesting is the subject of the present notice. It was first met with at the close of last March, growing in one locality only, near the top of the peak to the south-east of the Happy Valley, at an elevation of about 1000 feet, amidst a rank vegetation of grass and shrubs, close to the bed of a water-course. The plant bore old fruit only, and Mr. Ford, who thought it might be *Allomorphia pauciflora*, Benth., sent it me for determination. Though the specimen received was quite too incomplete to enable me to name it generally, it sufficed to show that it was different from any Chinese Melastomad hitherto recorded. In the middle of July, Mr. Ford, who kept his eye steadily on the locality, was rewarded by finding the plant in full bloom, and the specimens he placed at my disposal showed it to belong to *Otanthera*, a small genus, of

which the few known species* are met with in Burma, the Malayan Archipelago, the Philippines, and Eastern Tropical Australia. It is very distinct from all heretofore described, especially in its indumentum; but, on account of its fruit being, even when young, scarcely entitled to the qualification of fleshy, and at maturity perfectly dry and crustaceous, and splitting irregularly at the summit, it is manifestly most nearly allied to the Sumatran and Australian *O. bracteata*, Korth. (of which a very full description and well executed figure has been given by the discoverer†), and for this reason Blume proposed to separate generically the Sumatran plant, under the name of *Lachnopodium*.‡ From that, however, it is at once to be distinguished by its soft glandular pubescence, the shape of its leaves, its bractless inflorescence, inappendiculate calyx-throat, broadly ovate acute petals, and longer stamens, with the anthers three-spurred at the base. The flowers are sometimes, though rarely, tetramerous, and the cells of the ovary, as depicted by Blume in *O. moluccana*,§ are surrounded by double their number of large cavities, which in the present plant are nearly twice the size of the cells themselves.

The following diagnosis is drawn up from excellent materials, communicated by the discoverer of this interesting plant, to whom I have great pleasure in dedicating it :—

4475 Otanthera Fordii, *sp. nov.* — 1–1½ pedalis, ramulis tetragonis cum pedicellis calycibusque dense glanduloso-tomentosis, foliis plus minus disparibus cordato-ovatis obtuse acuminatis margine denticulatis utrinque opacis supra sparsim hirtellis sub lente punctis impressis minutissimis confertissime consitis subtus pallentibus pilis glandulosis creberrimis tectis 7-nerviis nervis venulisque transversis subtus prominulis 3–4 poll. longis 2 poll. latis petiolo 1–2 pollicari, cymis terminalibus et ex axillis summis plurifloris umbelliformibus omnino ebracteatis, pedicellis 5–6 lin. longis, calycis tubo campanulato 3 lin. longo lobis lineari-lanceolatis 1½ linealibus persistentibus, petalis orbiculari-ovatis acuminatis roseis 4 lin. longis, filamentis quam petala duplo brevioribus, antheris arcuatis subulatis basi antice 2- postice 1-calcaratis calcaribus parvis obtusis patentibus, stylo ad medium antherarum adtingente, capsula crustacea glabra, vertice dehiscente, seminibus minimis pallide brunneis.

In fruticetis ins. Hong-Kong, mense Julio 1880, collegit C. Ford. (Herb. propr. n. 21099.)

---

* There is considerable discrepancy in the number recorded by different authors. Blume (Mus. bot. Lugd.-Bat. i., 56) gives four, Naudin (Ann. Sc. Nat. 3e sér. xiii., 352) five, Miquel (Fl. Ind. bat. i., 1, 515) six, Bentham and Hooker (Gen. Plant., i., 746) two, Triana (Trans. Linn. Soc., xxviii., 55) seven, and Mr. C. B. Clarke (in Hook. f. Fl. Brit. Ind., ii., 522) two or three.

† Korthals, Verhand. Nat. Gesch. Bot., 235, t. 51.

‡ Les genres *Melastoma* et *Otanthera* font exception dans le groupe des Mélastomées à graines courbées en limaçon, par leur fruit pulpeux. (Triana, in Trans. Linn. Soc., xxviii., 164.)

§ Mus. bot. Lugd.-Bat. i., t. 20.

NOTES ON SHROPSHIRE PLANTS.

By William E. Beckwith.

Few counties in England present a more diversified surface, or a richer field for the botanist, than Shropshire; its high hills,—destitute of trees, like the Clee Hills, the Longmynds, the Stiper stones, and the Caradoc; or clothed with woods, like the Wrekin,—its other great tracts of woodland; the Rivers Severn, Tern, and Teme, with innumerable brooks, streams, and reservoirs; the meres near Ellesmere; the mosses near Whitchurch and Wem; the far-famed Bomere Pool, with a multitude of smaller pools and bogs; the beds of limestone round Much and Little Wenlock, and on the Welsh borders; the low rich valleys and poor uplands—all contribute to support various forms of plant-life.

Since Mr. Leighton published his excellent 'Flora of Shropshire' in 1841, great changes have doubtless taken place in the character of the soil, and drainage has either destroyed or circumscribed the limits of many of the bogs and pools ("Golding Pool, near Pitchford," and the "boggy ground near Mosterley," have long been drained). Yet I have often had great pleasure in finding plants still flourishing in localities instanced by him, and bearing mute testimony to the accuracy of his work.

With such a rich field for labour it may justly be said that my notes are extremely meagre, and to this accusation I plead guilty, offering as "extenuating circumstances" the facts that I only began them in 1876, and have only included the rarer plants found by myself or sent me by friends since that date.

I have followed the arrangement and nomenclature of Syme's edition of 'English Botany.'

Thalictrum flavum, L. Banks of the River Tern, and ditches in Attingham Park; banks of the Severn near Leighton, Buildwas, and Bridgnorth.

Ranunculus hederaceus, L. Small pools and ditches about Church Stretton, Frodesley, Atcham, Ellesmere, Eyton-on-the-Wealdmoors, and Leighton.

R. sceleratus, L. Very frequent about Ellesmere and Berrington.

R. Lingua, L. Bomere Pool, near Shrewsbury; Colemere and Whitemere Meres.

R. auricomus, L. Frequent in woods round the Wrekin.

R. parviflorus, L. On Charlton Hill, Wroxeter.

R. arvensis, L. Common in fields near Eaton Constantine, Leighton, and round the base of the Wrekin.

Helleborus viridis, L. Homer Common, near Much Wenlock; apparently quite wild.

H. fœtidus, L. Several plants of this species still grow by the road leading from Much Wenlock to Buildwas, a locality mentioned by Mr. Leighton in his 'Flora of Shropshire.'

Aquilegia vulgaris, L. Wood between Cound and Evenwood; wood near Buildwas Bridge.

Berberis vulgaris, L. Found in woods and hedges near Ludlow and Stokesay.

Nymphæa alba, L. Berrington; Bomere, Almond, and Hencott Pools, near Shrewsbury; Ellesmere Meres.

Nuphar lutea, Sm. Found in the same places as the last species, and in the River Tern at Attingham.

[*Corydalis solida*, Hook. I have seen specimens from woods near Cruckton Hall, where it is naturalized. Mr. R. M. Sergeantson has also shown me specimens gathered by the brook flowing from Evenwood to Cound.]

C. lutea, DC. Naturalized on old walls in the town of Ludlow.

C. claviculata, DC. Very frequent in the woods on and round the Wrekin. I have also seen specimens from Frodesley, Church Stretton, and Acton Burnell.

Raphanus Raphanistrum, L. The white-flowered variety of this plant has grown for several years in a field near Eaton Constantine.

Brassica tenuifolia, Boiss. Very frequent on walls in the town of Ludlow.

Cardamine amara, L. Very frequent by the numerous small streams that run from the Wrekin to the Severn. I have also found it in Attingham Park, near Cantlop's Cross, near Cressage, and by the sides of Cound and Shineton brooks. This species often grows in woods, usually in shadier places than *C. pratensis*.

C. sylvatica, Link. Frequent and very luxuriant in a small wood on the bank of the Severn near Eaton Constantine.

C. impatiens, L. Mr. R. M. Sergeantson brought me specimens of this species from near the Caradoc Hill, in the summer of 1880.

Arabis thaliana, L. Frequent on dry sandy and gravelly banks; very common on walls and rocks near Bridgnorth.

Barbarea vulgaris, R. Br. Not unfrequent along the banks of the Severn and Tern; by Cound and Shineton brooks, and about the Ellesmere Meres.

Nasturtium sylvestre, R. Br. Very frequent along the banks of the Severn.

N. palustre, DC. Banks of the Severn near Cressage; sides of Ellesmere Mere, under Oteley.

N. amphibium, R. Br. Right bank of the Severn, between Atcham and Brompton.

Thlaspi arvense, L. Common in the parish of Wroxeter, especially about Charlton Hill and Dryton.

Teesdalia nudicaulis, R. Br. Frequent about the High Rock, Bridgnorth; near Charlton Hill, Wroxeter.

Lepidium campestre, R. Br. Most abundant in cultivated fields round the Wrekin.

L. Smithii, Hook. Eyton Rock, and near Dryton, Wroxeter; Neaves Castle, near Leighton.

Reseda Luteola, L. Frequent about ruins and gravel-pits. Very numerous about lime-works and coal-pits.

Viola palustris, L. Frequent in damp woods near Bomere Pool.

V. odorata, L. The white variety is frequent near Leighton and Llynclys; and a lilac variety grows near Dryton, Wroxeter.

Drosera rotundifolia, L. A few plants in a field at the south-west base of the Wrekin; frequent on the Longmynds, on mosses near Bomere Pool, on Whixall Moss, and on a moss near Welshampton.

D. anglica, Huds. Rather frequent on a moss near Welshampton.

D. intermedia, Heyne. Frequent on mosses near Bomere Pool, and on Whixall and Welshampton mosses.

Dianthus deltoides, L. Frequent near Dryton, Wroxeter.

D. plumarius, L. Old wall in the town of Ludlow, where it has grown for more than fifty years; ruins of Haughmond Abbey.

Saponaria officinalis, L. Limestone quarries near Much Wenlock; hedge at Allfield, near Condover.

Silene inflata, Sm. Dry sandy banks and hilly ground; frequent about Berrington, Charlton Hill, Much Wenlock, and Leighton.

Stellaria aquatica, Scop. Banks of the Severn near Brompton; banks of the Teme below Ludlow; boggy ground near Eaton Mascott; ditches on the Wealdmoors near Eyton.

S. glauca, With. Ditch in Attingham Park; sides of Ellesmere Mere.

Arenaria trinervia, L. Woods and hedge-banks, very frequent, especially on light sandy soils.

Sagina nodosa, E. Meyer. A few plants near Colemere Mere, Ellesmere.

Spergularia rubra, Fenzl. Charlton Hill and Eyton Rock, Wroxeter; Atcham Bridge.

Montia fontana, L. Frequent about the Ellesmere Meres. I have also found it on Charlton Hill, Grinshill, near Craven Arms, and Leighton.

[*Claytonia perfoliata*, Don. I have specimens of this plant from Ryton, near Shifnal, where it is perfectly naturalized.]

Elatine hexandra, DC. Bomere Pool, Whitemere Mere.

Hypericum Androsæmum, L. Frequent, and apparently wild, in woods round the Wrekin. I have also found it growing near Cound, Kenley, Acton Burnell, Stokesay, and Downton Hall, by Ludlow.

[*H. calycinum*, L. Quite naturalized near Eyton Rock, Wroxeter.]

H. perforatum, L. Hedges and woods, everywhere.

H. dubium, Leers. Hedges and woods; very often found about the Wrekin.

H. tetrapterum, Fries. Wet boggy places, and by brooks and ditches; not uncommon about Eaton Constantine, Leighton, Cound, and Berrington.

H. humifusum, L. Frequent on high ground. I have found it on the Longmynds, near Stokesay, Bridgnorth, the Wrekin, Eaton Constantine, Bomere, and Ellesmere.

H. pulchrum, L. Woods about the Wrekin, on Wenlock Edge, and near Cound; very frequent.

H. hirsutum, L. Woods and hedges, frequent; very common on the limestone about Much Wenlock and Buildwas.

H. montanum, L. Very rare. In 1878 I found several specimens near Stokesay, on the hill where *Astrantia major* grows.

H. Elodes, L. By the side of Bomere Pool.

Malva moschata, L. Dry sandy banks; occurs in many places along the banks of the Severn.

[*Linum usitatissimum*, L. A few plants in fields near Acton Burnell.]

Geranium pratense, L. Banks of the Severn, about Bridgnorth.

G. pyrenaicum, L. Frequent in the town of Bridgnorth and about Cound. I have also found it at Shelton, near Shrewsbury, and near Shifnal.

G. pusillum, L. Very frequent about Cound, Berrington, and Condover.

G. columbinum, L. Not unfrequent on dry gravelly banks. Occurs near Wroxeter, Condover, Buildwas, Leighton, Cressage, and Ellesmere.

G. lucidum, L. Frequent about Ludlow and Downton Castle. I have seen it also near Church Stretton, Acton Burnell, Cressage, Uppington, and the Bulthy Hill near Middletown.

Erodium cicutarium, L'Herit. Very frequent about Bridgnorth and Shifnal.

Impatiens Noli-me-tangere, L. Mr. R. M. Sergeantson has brought me several specimens of this plant, which grows apparently wild near Acton Burnell.

Euonymus europæus, L. Frequent in hedges near Eaton Constantine and Leighton, and in woods round Much Wenlock, Cound, and Ellesmere.

Rhamnus catharticus, L. Frequent in a wood between Cound and Evenwood.

R. Frangula, L. Frequent about Whitemere and Blackmere Meres, near Ellesmere; occurs also on Shomere Moss, near Church Preen, and at the foot of Tentree Hill.

(To be continued).

THIRD SUPPLEMENT TO THE FERNS RECORDED IN GRISEBACH'S 'FLORA OF THE BRITISH WEST INDIES.'

By G. S. Jenman.

Having left Jamaica, I now add to my previous contributions to the 'Journal of Botany' on the fern flora of the island (*vide* vol. vi., new series, page 263, and vol. viii., page 257), a few hitherto unrecorded plants which have come under my observation. I wish at the same time to thank Mr. Baker for his kindness from time to time in comparing and determining at Kew my gatherings, without which service these papers would possess little if any value, removed as I have constantly been in my labours so far from access to any collection of properly authenticated specimens. The series contains upwards of one hundred and twenty species and varieties

hitherto unknown to exist in the country. The investigation was made mostly in the very rare and brief intervals allowed by official work; and the results indicate forcibly how much yet remains to be accomplished before the general flora will be exhausted, much as Jamaica has been explored by botanical collectors. I hope to complete during the present year a handbook of the fern flora of the island, which has been in progress for some time, giving, in addition to precise descriptions, the range of each species, and, if limited or rare in its distribution, the locality or localities where found; and much other information gained in the woods in the course of several years spent in pursuit of other work. Such a work is much wanted by the many residents and visitors who take an interest in the extensive and abounding fern vegetation, the charm of which is irresistible.

Cyathea arborea, Sm., var. *concinna*, Baker.—Pinnæ much narrower than in the type, only 2½–3 inches wide; pinnules 3 lines wide, and cut half-way down, often contracted near the base; texture less rigid, and under surface rather more fibrillous scaly; veins simple; sori very scant; stipites much less armed (No. 2, Herb. Kew, 1879). A very common plant in the forest below Newhaven Gap, Cinchona Plantations, 6000 alt., and on the slopes of St. Catherine Peak, near Irene Castle. It is quite as closely related to *C. Tussacii*, Desv., and is thus a link between these species.

C. DISSOLUTA, *Baker MSS.*, n. sp.—Trunk erect, 3 inches in diameter, 10–12 feet in height; stipites curved outwards, 15–24 inches long, bright castaneous, armed with short bluntish prickles, and densely clothed at the base with lanceolato-attenuate, glossy, dark brown scales, which are over ½ inch long and 1½ line wide; fronds 3–4½ feet long by 18–24 inches wide, lower pinnæ reduced, but not signally, bi-tripinnate; pinnæ petiolate, 8–14 inches long, 3–5 inches wide, lowest pinnules hardly reduced; pinnulæ oblong, acuminate, truncate and subpetiolate, ½–¾ inch wide, 2–3 inches long, pinnatient nearly to the costulæ (or sometimes quite pinnate at the base) segments subfalcate, obtuse, toothed, 3–5 lines long, 1½ line wide; veins fine, simple, or forked; sori copious, extending half to two-thirds up the segments, situated immediately below the fork of the vein; involucre membranous, castaneous, entire and quite enclosing the sorus before maturity, ultimately much ruptured; texture firm; colour dark above, but rather paler beneath; surfaces naked, but the costæ and flexuose costulæ rusty pubescent above, the latter with a few minute bullate scales beneath; rachis channelled, muricate below (No. 1, Herb. Kew, 1879). Intermediate between *gracilis* and *Schanschin*. From the former it is distinguished by its prickliness, compact, and much less diffuse habit, and from the latter by the perfectly glabrous, bright surfaces. Frequent between 5000 and 6000 feet altitude. Near Morce's Gap, Cinchona Plantation, and Portland Gap, Blue Mountain Peak.

TRICHOMANES SETIFERUM, *Baker MSS.*, n. sp.—Rhizome thread-like, diffuse, spreading over the surface of large stones, puberulous; fronds membranous, scattered, 1–2 or 3 lines long, varying in shape from orbicular to linear; stipites ¼–½ line long; veins fine, close,

patent, with or without spurious venules between; midrib more or less distinct to the apex, where in the fertile fronds it terminates in the sorus; margin ciliate, with stellate hairs, uneven, repand; surfaces naked; sorus single, apical; involucre immersed to the neck, mouth two-lipped; receptacle hardly exserted (Herb. Kew, 1879). By far the most minute of the West Indian ferns. Rare in wet gullies, 4000–5000 feet altitude.

Asplenium (Diplazium) diminutum, *Baker MSS.*, n. sp. Rootstock short, creeping, 1–2 lines thick, the advancing point clothed with small dark-coloured scales; stipites apart, but not distant, 4–9 inches long, rather slender, greyish, channelled, naked or with a few deciduous scales at the base; frond lanceolato-acuminate or ovato-lanceolate, 5–9 inches long, 2½–5 inches wide, the lowest pinnæ not reduced or slightly larger, bi-tripinnate, pinnæ and pinnulæ rather distant, the former 1½–3 inches long by ¾–1¾ wide, serrato-acuminate, petiolate, the latter ovate-oblong, obtuse, sharply toothed, pinnatifid, or fully pinnate at the base, ½–¾ inch long, and cuneate below; texture thin, colour dark green; surfaces naked; inferior veins forked; sori copious, the inferior double, reaching from the midrib to the marginal teeth; involucre dark, membranous; rachis slender, subflexuose above (No. 19, Herb. Kew, 1879). Rare on wet rocks at 2000–3000 feet altitude.

Hypolepis Purdieana, Hook., is a much larger plant than has hitherto been supposed, from 2–4 feet high, and approaches *H. repens* by the unarmed variety of that species (*inermis*, Hk.), which is common on rock-strewn ground and coffee plantations of the Port Royal Mountains, at from 3000–5000 feet altitude. It is well marked by a few characters, such as its viscid fibrillose surface, herbaceous texture, castaneous stipes, and other vascular parts. It is, however, doubtfully distinct from *H. repens*, which again can only be distinguished from *Polypodium punctatum*, Thunb., by the presence of an involucre and its prickly pale-coloured stems.

Pteris quadriaurita, Retz., var. *felosma*, J. Sm.

P. quadriaurita, Retz., var. *affluentius*.—Buds densely coated with firmly adpressed, minute, greyish scales; stipites 2–3 feet long; frond 3–4 feet long, 2–3 feet wide; pinnæ few (6–12), distant, lowest with simply one anterior branch, longest lateral pinnæ 15–20 inches long, with a long caudate entire point; pale straw-coloured throughout (No. 12, Herb. Kew, 1879). This plant is so well marked—contrasting in several features with the (local) normal form—that it cannot be overlooked in dealing simply with a local flora.

P. pedata, Linn., and *P. palmata*, Willd., should be combined; they represent simply the more or less extremes in development and cutting of the same plant. I have several times gathered both from the same individuals.

Asplenium rhizophorum, Linn., var. *supersum*.—Habit loose, bipinnate; pinnulæ small, 2–3 lines long, ovate or obovate-cuneate, subincised. Resembling *A. rutaceum*, Mett., but of looser habit, with longer stipites.

Acrostichum siliquoides, *Jenman*, n. sp.—Rootstock short, fibrous,

clothed with bright ferruginous subulate scales; stipites cæspitose, numerous or few, dependent, 2–4 inches long, thickly clothed with long hair-like glossy golden scales; fronds linear-oblong, subsinuate, 4–10 inches long, ¾ to nearly 1 inch wide, bluntly pointed, gradually tapering into the petiole, thickly clothed, particularly before maturity, on both surfaces with cuneate scales; texture firm, rather thickish; veins parallel, nearly 1 line apart, simple and forked; fertile frond short, ovate-elliptical, at first folded together with even margins, expanding eventually; petioles long (No. 6, 1877, Herb. Kew). Infrequent on open banks from 2500–5000 feet altitude. Distinguished from *A. villosum*, Sw., by the narrower, thicker, more hairy, barren frond, and difform, spoon-shaped, pod-like, fertile frond, and a peculiar astringent smell. Considered by Mr. Baker a variety of *A. villosum*; I, on the other hand, look upon it as a peculiar and particularly well-marked plant.

A. (*Gymnopteris*) *alienum*, Sw., var. *flagellum*.—Frond large, with a long-winged sinuato-repand tail, having one or more scaly buds along it in the axils of the undeveloped pinnæ; fertile frond sometimes, but not always, conform (No. 26, Herb. Kew, 1879). Common near the Botanic Gardens, St. Mary, 500 feet altitude.

SHORT NOTES.

Potamogeton lanceolatus, *Sm.* (see p. 11).—I have received the following from Prof. T. M. Fries, of Upsala, concerning a specimen of this plant which I sent to him recently:—"I can inform you that this interesting plant is quite different from *P. nigrescens*, Fr. The latter is near to, and probably not distinct from, *P. rufescens*, Schrad.; while the former (*P. lanceolatus*) seems to be next to *P. nitens*, Web." This shows therefore that the late Prof. E. Fries's remark ('Summa,' 214) is not correct; and we are left in the same difficulty as before concerning Smith's plant. I cannot think that it has any especial relationship to *P. nitens*, which has the bases of its leaves broad, rounded below and semi-amplexicaul. In *P. lanceolatus* they are all narrowed to the base or even stalked.—C. C. Babington.

Osmunda regalis, *L.*, in Cambridgeshire.—*Osmunda regalis* has been excluded by Professor Babington from the Cambridgeshire Flora, on the ground that, although inserted by Dent in the second Appendix to the Cambridge Catalogue as growing at Gamlingay, it had been found there by no other botanist, and that "Ray does not give the locality in his Synopsis nor elsewhere." But Dent's statement is confirmed indirectly in the second edition of the Synopsis, p. 18, where the "*Fungus fontanus purpureus elegans*, D. Vernon," is localised "at Gamlingay, in Cambridgeshire, where the *Filix florida* grows." The *Osmunda* is therefore entitled to a place among the extinct plants of the county.—R. A. Pryor.

Eryngium campestre in Suffolk.—The discovery by Mr. Hanbury of *Eryngium campestre* in Kent, and Mr. Briggs's notice in his lately published 'Flora of Plymouth,' will have called attention to the earlier records of its occurrence in our island, especially now that its position as a native has in these instances been generally conceded. It is true that Mr. Baker had previously disposed of its claims as a Northumbrian plant with a bare mention of its name in a list of ballast-hill introductions, but its endurance for nearly two hundred years in the same locality at Friar's Goose might have given it a right to a less unceremonious dismissal. Every fresh locality along our shores will add a link to the chain of confirmatory evidence, nor is it a solitary instance of a plant of general continental distribution that is restricted, or nearly so, to the coast line in Britain. *Eryngium campestre* was collected about five-and-twenty years back, and on more than one occasion, by the Rev. E. N. Blomfield, at Dunwich, in Suffolk, where it is now said to be extinct, but there is a much earlier notice of its occurrence in the county. In the herbarium of Buddle there is a specimen with the following note:—"*Eryngium mediterraneum seu campestre*, p. 986,* Lob. 22. I found it on ye coast of Suffolk, in ye isle of Lovingland, but very sparingly." It was probably collected during his residence at Henley, circ. 1697. Loving or Lothing land, the Ludinga land of Domesday, is that northernmost portion of Suffolk which is included between the estuaries of the Yare and (Lake Lothing) the Waveney; much probably remains there to reward the explorer.—R. A. Pryor.

Scirpus maritimus, *L.*, in Berkshire.—I find that I have omitted to place on record that a specimen of the above-named plant was brought to me in 1873 by Mr. F. Walker, who had collected it in August of that year at Marcham, near Abingdon. My attention has now been drawn to it in consequence of my having found a specimen in Rudge's herbarium labelled "Sonning, Berks." These localities are, of course, quite distinct; and as the plant is not recorded for the West Thames subprovince in 'Topographical Botany,' or, so far as I can ascertain, elsewhere, its occurrence in these inland stations seems worth noting.—James Britten.

Plants of East Cornwall.—On looking over my botanical work for the last year or two I find the following species, for which there is no record as growing in this district either in 'Topographical Botany' or in the 'Journal of Botany.' *Ranunculus Lingua*, L.; Mere Lake, Bude. *Carduus pratensis*, L; plentiful in a marshy spot at Dubson, one mile and a half from Launceston, June, 1879 (also a few plants by the roadside from Broadwood to Bratton-Clovelly, North Devon, June, 1875). *Neottia Nidus-avis*; a few plants; Week S. Mary, June, 1880.—W. Wise.

---

* This is a reference to his MS. Flora, now unfortunately separated from the herbarium to which it is the key by the removal of the latter from the British Museum to the new Natural History Museum at South Kensington.

What is the Dunwich Rose?—Among the traditions of the ancient city of St. Felix, whose crumbling ruins have for centuries been yielding to the "rage and surges of the sea," the "Dunwich Rose" has held no inconsiderable place in popular esteem, and renked high among the established wonders of the guide-book. But it has not, so far as I am aware, attracted the attention of any botanical writer, and yet, from an account that recently appeared in a number of 'Fraser's Magazine,' it would seem not unworthy of further inquiry. The rose is there described as springing from the clefts of the ruined fragments of the Grey Friars' wall, and "throwing long sprays and wreaths of blossom over the crumbling stone. . . . It partakes of the nature of the Scotch rose, hardy and spreading rapidly. It grows all over the sand cliffs and pent-lands about there, creeeping along the ground where it can find nothing to cling. The flower has a powerful scent; it is a single blossom of purest white velvet, with anthers of black or brown, a smooth brown stem, with long sharp thorns and smooth pointed dark green leaves, growing like the blackberry leaves, for which at first we mistook them." (E. L. Cornish in 'Fraser's Magazine,' n. s. vol. xvii. p. 523.) This is suggestive rather of *Rosa spinossisima* or *R. arvensis* among British roses, both of which would be likely to occur in the neighbourhood, but there are points of detail that are irreconcileable with the characteristics of either. As in other instances, it is reported to have been introduced by the "monks," and to grow nowhere else; according to other authorities, it is found with pink flowers at Framlingham, once the stronghold of the Bigods, but this is hardly consistent with the account in Fraser.—R. A. Pryor.

Extracts and Notices of Books and Memoirs.

REPORT OF THE HERBARIUM OF THE ROYAL GARDENS, KEW, FOR 1879.

By Sir J. D. Hooker, K.C.S.I., &c.*

Herbarium.—The most important accessions to this department consist of:—A very complete set of the plants collected in Sumatra by Prof. Beccari, of Florence, presented by himself.

An almost complete herbarium of the Canadian Flora, formed by Prof. Macoun, of Belleville, the joint property of that gentleman and of the Canadian Commissioners of the Paris Exhibition.

A herbarium of upwards of 1500 Fijian plants, collected by Mr. Horne, F.L.S., Director of the Mauritius Botanical Gardens, when on a mission to the Pacific Islands to procure sugar-canes.

---

* [It seems necessary to state, as accounting for the appearance of this abstract so long after date, that the Report, although dated Jan. 1st, 1880, did not actually appear until the latter end of October of that year.—Ed. Journ. Bot.]

A very large collection of Mexican and South U.S. plants, collected by Dr. Parry when on a botanical expedition from Central Mexico to the United States.

A continuation of M. Glaziou's Brazilian collections (nearly 1500 species); also of Welwitsch's West African ones, presented by the Government of Portugal; and the completion of Brown's Australian Herbarium; the British Herbarium of the Botanical Exchange [Record] Club; a very fine collection of European Roses and Rubi from G. C. Joad, Esq., of Wimbledon.

The principal contributors have been:—

Europe.—Bennett, A. W.; *Polygaleæ* (9). Botanical Record Club; Herbarium of. Cooke, M. C.; British and miscellaneous Fungi (purchased, 125). Danford, Mrs.; Levant (18). Fitch, W. H.; Servian (45). Gandoger, —; *Rosæ* (purchased, 411). Joad, G. C.; *Rosæ* and *Rubi* (420). Henriques, J.; Portugal (107, and drawings). Heldreich, Prof.; Greece (purchased, 177). Kunze; *Fungi exsiccati* (purchased, 200). Larbalestier; Lichens (purchased). Sanio, Dr. C.; German (42). Société Dauphinoise pour l'Echange; (purchased, 471). University College, London; a miscellaneous collection. Van Thuemen, F.; *Mycotheca universalis* (purchased, 300). Westendor., —; Belgian Cryptogams (100). Wittrock, V., and Nordstedt, O.; *Algæ* (purchased, 100). Vise, Rev. J. E.; *Microfungi* (purchased, 100). Various European plants have been received from Dr. Archangeli, Dr. Huntingdon (Italy), J. A. Jenner, J. C. Mansell Pleydell, H. T. Mennell, Prof. Oliver, Rev. W. H. Painter, Rev. W. Rogers, J. Sanders, C. E. Broome, Rev. W. A. Leighton, J. E. Williams.

North and Temperate Asia.—Aitchison, Dr.; collections made as botanist to the Kuram field force in Afghanistan (about 1000). Collett, Major H.; Afghan (81). Ford, Chas. S.; China and Kong (108). Markham, Capt. A. H.; Nova Zembla (80). Perry, W, Wykeham; Scind and Persian Gulf, &c. (95). Post, Prof.; Syria (137). Preston, Rev. T. A.; China (22). A few Japanese plants have been received from J. Bissett; Chinese, from E. Bradford, A. Davenport, and Dr. Hance.

Tropical Asia.—Beccari, Prof.; Sumatra (900). Beddome, Col.; Madras Presidency (200). Duthie, J. F.; N.W. India (10, and drawings). Meyer, Dr. A. B.; Riedel's Timor plants (17). Murton, H. J.; Singapore (94). Small contributions have been received of Himalayan plants from Robt. Ellis and J. Gamble; and of Bornean orchids, collected by F. W. Burbidge, from Messrs. Veitch.

Africa and African Islands.—Barber, Mrs. M. E.; Gold Fields (44). Bolus, H.; Cape Restiaceæ and Ericeæ (115). Cosson, Mons.; Letourneux's Egyptian (138). Kirk, Dr. J.; Zanzibar and Comoro (43). Perry, W. Wykeham; Madagascar and Comoro (15). Schweinfurth, Dr.; Egypt, &c. (76). Portugal, Government of; Welwitsch's African (665). Stone, General; Purdy's Darfur (132). Wood, J. M.; Natal (657). Smaller contributions have been received of S. African plants from Sir H.

Barkly and T. T. Chamberlain; of Madagascarian, from Miss Gilpin; and of Liberian, from E. H. Holmes.

North America.—Curtiss, A. H.; Florida (purchased, 250). Farlow, Anderson, and Eaton; *Algæ* (30). Macoun, J.; British N. America (partly purchased, 2805). Parry, C. C.; Mexican and New Mexican (1250). Ravenel; American *Fungi* (purchased, 200). Smaller contributions have been received from Drs. Eaton and Engelmann, Messrs. Hemsley, Lemmon, Mohr, Townshend, Sereno Watson, and Miss Frances J. Myers, and (Bermuda plants) from Sir J. H. Lefroy.

West Indies.—Brace, L. J. K., communicated by H.E. Gov. Robinson; Bahamas (150). Holme, Rev. H. K.; Montserrat (60). Meyer, G. L.; Tobago (33). Murray, H. B.; St. Lucia (39). Prestoe, H.; Trinidad (10).

Central and South America.—Coppinger, Dr.; Patagonia (17). Ernst, Dr.; Caraccas (8). Glaziou, A.; Brazils (1447). Kalbreyer; New Grenada (298). Lorentz, Dr.; Argentine Provinces (purchased, 51). Thurn, E. F. im; British Guyana. Türckheim, Mons.; Guatemala (purchased, 108).

Australasia, Polynesia, and Antarctic Islands.—Bennett, the late J. J.; completion of Brown's Australian Herbarium (1056). Berggren, Dr.; New Zealand (30). Buchanan, Rev.; New Caledonia (61). Carson, D.; Australia (9). Cheeseman, T. F.; New Zealand (10). Gray, Dr. A.; Kerguelen's Land (55). Hill, Walter; Frazer's Island (5). Horne, John; Fiji Islands (1530). Kirk, Thos.; New Zealand (7). Mueller, Baron von; Australia (6).

Familiar Garden Flowers; figured by F. E. Hulme, F.L.S., and described by Shirley Hibberd. First Series. London: Cassell, Petter, Galpin, and Co. 1880.

This is a pretty-looking volume, owing its attractiveness to the coloured figures of some of our best known garden favourites. Some of these are very well executed, others—e. g., *Lilium pomponium*—unsatisfactory; but there is a scrappiness about most of them which prevents justice being done to the plants selected; the vignettes and initial letters are especially pretty. The letterpress, however, is poor; and this is the more to be regretted, inasmuch as a good deal of interesting information might have been giveu about some, at any rate, of the plants figured. But instead of this, Mr. Hibberd gives his personal reminiscences, which are "of no value to anyone but the owner," as advertisements say; and the little information he attempts to bestow is not always trustworthy. For instance, *Primula elatior* is not the scientific equivalent of the Polyanthus (p. 25); "the common yellow crocus of gardens" is *not* "the *Crocus luteus* of the botanist" (p. 98); we fail to see why *Convolvulus minor* is a "preferable name" to that of *C. tricolor*, or why the latter is "appropriate but indefinite" (p. 81); and so on. At first sight one is inclined to criticise Mr. Hibberd's spelling of *Mathiola* and *Malcomia*, but this spelling is

in each case that employed by Robert Brown when (in Aiton's 'Hortus Kewensis,' 2nd ed., vol. iv., pp. 119 and 121) he first established these genera. Mr. Hibberd is severe when he finds what he terms (p. 105) "a showy but most egregious blunder" in some unnamed popular work; but he would do well to remember a proverb about the dwellers in glass houses, for he states (p. 46) that "London Pride" is a modern name for *Saxifraga umbrosa*, and quotes Dr. Prior's derivation of it (from "Mr. London, of the firm of London and Wise") with approval, even suggesting that "it should therefore be designated London's Pride"—the fact being that *S. umbrosa* was called London Pride at least as long ago as 1727 by Threlkeld. Mr. Hibberd has had a good opportunity of producing a useful and interesting book, but he has not fully availed himself of it. J. B.

Under the title of "The Kew Arboretum," Mr. George Nicholson has begun, in the 'Gardeners' Chronicle,' a series of papers descriptive of the hardy trees and shrubs, in which not only those in actual cultivation at Kew, but others will be included. This series, which we believe will be reprinted in book form, will go far to supply a want, nothing of the kind having been published in England since Loudon's 'Arboretum,' which is now somewhat out of date.

We note that our contemporary, the 'Garden,' has reduced its price, while its attractive features have increased. A coloured plate is given with each number; and although the subjects represented are naturally selected for their horticultural value, some of them are of botanical interest. This is shown by the fact that two of the plants lately figured — *Hibiscus schizopetalus*, Hook. f., and *Disa macrantha*, Hort. (= *D. megaceras*, Hook. f.)—have also been recently figured in the 'Botanical Magazine' (tt. 6524, 6529). Mr. Robinson has also started another periodical, entitled 'Gardening,' at the price of a penny weekly, which contains a vast amount of horticultural information, and is attractively illustrated.

New Books.—B. H. van Nooten, 'Fleurs Fruits et Feuillages de l'Ile de Java' (Brussels, Muquardt). — H. Muller, 'Alpenblumen, ihre Befruchtung durch Insekten und hire Anpassungen an dieselben' (Leipzig, Engelmann). — 'London Catalogue of British Mosses and Hepatics' (London, Bogue, 9*d.*; printed on one side only, 1*s.*)—O. Heer, 'Flora Fossilis Arctica' (band 6), Zurich, Wureter.—C. Roumeguere, 'Flore Mycologique du Département de Tarn-et-Garonne' (Montauban, Forestià). — H. Baillon, 'Natural History of Plants,' vol. vi. (L. Reeve & Co.)

Articles in Journals.

December.

Journal of the Linnean Society (Botany, vol. xviii., no. 109).—J. G. Baker, 'Synopsis of *Aloineæ* and *Yuccoideæ*' (concluded).—N. E. Brown, 'On some new *Aroideæ*' (pt. i. tt. 3).

Scottish Naturalist.—J. Cameron, 'The Gaelic Names of Plants.' —J. Stevenson, 'Mycologia Scotica.'—F. B. White, 'Fungi of Perthshire.'—Id., 'Remarks on *Polypodium flexile* and its relation to *P. alpestre.*'

Nuov. Giorn. Bot. Ital. (Nov. 25).—L. Caldesi, 'Floræ Faventinæ Tentamen' (concluded).—A. Borzi, '*Hauckia*, a new Palmellacea from the Island of Favignana' (1 tab.) — C. Massalongo and A. Carestia, 'The *Hepaticeæ* of the Pennine Alps' (tt. 4: *Scapania Biroliana*, *Anthella* (*?*) *phyllacantha*, spp. nov.)—L. Nicotra, 'Vegetation of Salvatesta' (*Hyoseris pleiophylla*, n. sp.) — A. Mori, 'Parthenogenesis in *Datisca cannabina.*'

Science-Gossip. — G. Massee, 'Notes on some of our smaller Fungi.'

Bot. Notiser.—S. Almquist, 'On polymorphic groups of plants.' —E. Adlerz, 'On the anatomy of bud-scales.'—A. P. Winslow, 'Rosæ Scandinavicæ.'

Magyar Nov. Lapok.—C. Mika, 'On the vegetative progermination of *Pistillaria pusilla.*'—(Suppl.) A. Kanitz, 'Plantæ Romaniæ hucusque cognitæ' (continued).

(*Coulter's*) *Botanical Gazette.* — J. W. Chickering, 'Plants of Roan Mountain.'—Id., '*Nabalus Roanensis*, n. sp.'—W. K. Higley, 'Carnivorous Plants.'

American Naturalist.—C. E. Bessey, 'Sketch of Progress of Botany in U. S. during 1879.'—L. P. Gratacap, 'Botany of a City Square.'—W. W. Bailey, 'A dispermous acorn.'

Bull. Torrey Bot. Club.—A. Brown, 'Ballast plants in and near New York City.'

Naturalist (Huddersfield).—J. Cash, '*Orthodontium gracile.*'—W. West, 'Buckinghamshire Lichens.'

Œsterr. Bot. Zeitschrift. — L. v. Vukotinovic, '*Silene Schlosseri*, n. sp.' — C. Dufft, 'A new form of *Rosa venusta.*' — A. Oborny, 'Vegetation of Thaia (Iglau).'—V. v. Borbas, '*Galium sylvaticum* in Hungary.'—F. Krasan, 'Vegetation of Gorz and Gradisca' (concluded).—W. Voss, '*Peronospora viticola.*'—A. Hausgirg, 'Botany of Koniggrätz.' — M. Gandoger, 'Pugillus Plantarum' (contd.; forms of *Polypodium vulgare* and *P. Dryopteris*).—S. S. von Müggenburg, 'Mycological Notes.'—P. G. Strobl, 'Flora of Etna' (contd.)

Hedwigia.—F. v. Thümen, 'Reliquiæ Libertianæ.'—P. Richter, 'On the question of the possible genetic relationship of several unicellular *Phycochromaceæ.*'

Flora.—A. Minks, 'Morphological lichenolical studies' (concluded.)—F. Arnold, 'Lichenological Fragments.'—P. G. Strobl, 'Flora of the Nebrodes' (contd.)

Botanische Zeitung. — K. Goebel, 'On the Morphology and Physiology of Leaves.'—E. Strasburger, 'On multinucleate cells and embryogeny of *Lupinus*' (1 tab.)—E. Stahl, 'On the influence

of the intensity of light on the structure and arrangement of assimilatory parenchym.'—A. F. W. Schimper, 'Researches on the origin of Starch-granules.'

Proceedings of Societies.

Linnean Society of London.

December 2nd, 1880.—Prof. Allman, F.R.S., President, in the chair.—The following gentlemen were elected Fellows of the Society :— Messrs. F. A. Canton, C. B. Cory, Charles Fawcett, Charles L. Jackson, Paul H. M'Gillivray, R. W. Emerson M'Ivor, and Ernest L. Sellon.—Mr. Thomas Christy drew attention to a series of Agarics from Brisbane, Queensland, forwarded him by Dr. Bancroft; and afterwards showed and made remarks on some fruits of a species of *Capsicum* from Southern Europe, distinguished by their short ovate shape and their total absence of pungency.—The Rev. G. Henslow demonstrated the peculiarities of a malformed flower spike of *Verbascum nigrum*.—The Secretary read a paper "On an *Erythræa* new to England," by Mr. Frederick Townsend. This plant, obtained in the Isle of Wight, has been already noticed in this Journal for 1879 (p. 327); and Mr. Townsend has kindly forwarded us an abstract of his paper, which will appear in our next number.—An important lengthy communication, "On the Conifers of Japan," by Dr. Maxwell Masters, was read in abstract; it deals with their structure, affinities, synonymy, and geographical distribution. There are thirteen genera recorded in Japan, whereof one only is peculiar to the country, and they comprise forty-one species, exclusive of varieties and doubtful natives; twenty-two are endemic. Nine or ten species are common to Japan and the mainland of N.E. Asia, and other facts point to a wide distribution. Nevertheless the large number of endemic species and one endemic genus lead Dr. Masters to the inference that Japan may have formed a special centre whence Conifers have migrated elsewhere. Numerically the coniferous alliance is greatest between Japan and China. The approximation to the American flora of the east side is numerically extremely small, but when representative species of Conifers are taken into account the relation is closer, though less than that illustrated by other orders of flowering plants. Dr. Asa Gray supported by Prof. Oliver believe an analogy exists between the floras of Tertiary Central Europe and the recent floras of the Eastern American States and Japan. However this may be, Dr. Masters lays some stress on the probability of a dispersal from a Japanese centre, and, among other subsidiary reasons, adds the migration southwards from the polar regions, now admitted by botanists on all sides. The paper concludes with an enumeration of all the known and rare species of Conifers of Japan, and much interesting matter connected therewith.

December 16*th*.—Prof. Allman, F.R.S., President, in the chair.—Messrs. Edward Brown, H. E. Dresser, J. A. Canton, H. O. Huskisson, and Lieut.-Col. Godwin Austen were elected Fellows of the Society.—The President announced that the meeting should be made special for the purpose of electing a Councillor to take the place of Mr. Bentham retired.—Dr. Thomas Boycott exhibited a series of microscopical specimens and sections illustrative of the growth of the fruit of the Orange, and read a short note thereon.—Dr. Maxwell Masters exhibited an example of the so-called "Kohl Rabbi," in which development of side shoots took place in consequence of injury to the terminal bud.—Some Syrian Figs were shown by Mr. Percival D'Castro, and inquiry made of the Fellows as to their species or other information; it being intended to introduce their cultivation into the South of France, but authentic published data concerning this very excellent variety was scanty.—Two most interesting physiological papers were read by Mr. Francis Darwin: (1) The theory of the growth of cuttings, illustrated by observations on the Bramble (*Rubus fruticosus*); and (2) On the means by which leaves place themselves at right angles to the direction of incident light.

January 20*th*, 1881.—The Rev. J. M. Crombie, F.L.S., in the chair.—Several portfolios of British Sea-weeds, elegantly prepared by Mr. F. W. Smith, of 5, Clifton Villas, Falmouth, were exhibited by the Rev. J. Gould.—A new form of microscopical cabinet, designed by Mr. W. Hillhouse, F.L.S,, of Cambridge, was explained by him, its compactness and portability, &c., rendering it advantageous to teachers.—Mr. T. Christy exhibited some horn-shaped galls growing on a branch of *Pistacia atlantica*, and somewhat similar in appearance to those known in India under the name of "Kalera-singhi" galls. From the galls a substance exuded which was not unlike Chian turpentine. Mr. Christy also drew attention to a good example of the fruit of the White Quibrachio.—The first botanical paper read was "Notes on the *Orchideæ*," by Mr. George Bentham, F.R.S. This important contribution is prefaced by a short historical sketch of the more prominent workers in this group from the end of last century. The wonderful variety of tropical forms of Orchids early attracted attention among botanists, and in later years Loddiges' collections were noteworthy; and having become fashionable and popular objects of cultivation, through the example set by the Duke of Devonshire in his Chatsworth collection, a still more marked incentive to their production arose from the studies of Charles Darwin on their singular modifications of fertilising apparatus and its protecting perianth. In their systematic arrangement Swartz's labours (1800), and afterwards the observations of the Richards, Dupetit-Thouars, and others, have become obsolete from the vast influx of forms then unknown. Robert Brown first established the principles of their classification on a solid basis, and Lindley afterwards, in his genera and species of Orchids, further summarised and grouped in such a way as were to remain true till the present day. Blume's labours must always take a high

rank; excellent analysis of generic characters are to be found in Sir W. Hooker's writings; and the illustrations of Wight, Griffith, Fitzgerald, and others are invaluable. The younger Reichenbach has devoted great attention to this group, and especially those in cultivation, but from him we still lack a synopsis of contrasted characters adaptive to the limitation of tribes and genera. Dr. Pfester, of Heidelberg, has studied *Orchideæ* according to their vegetative characters, and thus has made an important advance. J. G. Beer, of Vienna, in strongly criticising Lindley's classification, proposes a division of the order into six tribes, founded solely on modifications of the labellum, but to the total neglect of all other characters structural or vegetative. In reviewing the Lindleyan system Mr. Bentham observes that the primary division founded on the consistence of the pollen has not been replaced by any other equally good, although it is by no means absolute. He admits that the distinctions founded upon the so-called caudicles and gland can scarcely be maintained, independent of the confusion occasioned by the term "caudicle" having been applied to three different parts of the pollinary system. In the case of *Vandeæ*, Darwin, distinguishing it from the caudicle, proposes to call it "pedicel"; but as this word has already a special designation in some flowers, Mr. Bentham thinks "stipes" a more appropriate term. The results of his detailed examination of all the genera proposed or established, of which he could procure specimens living or dry, checked by published descriptions and illustrations, has been their distribution into five tribes and some twenty-seven subtribes, as tabulated below. Mr. Bentham thereafter enters into lengthened explanations of the several tribes, subtribes, and more remarkable genera in the order, in his usual critical and careful manner.

ORCHIDEÆ.

Tribe I. EPIDENDREÆ.
Subtribe 1. Pleurothalleæ.
" 2. Microstyleæ.
" 3. Liparieæ.
" 4. Dendrobieæ.
" 5. Erieæ.
" 6. Bletieæ.
" 7. Coelogyneæ.
" 8. Stenoglosseæ.
" 9. Lælieæ.

Tribe II. VANDEÆ.
Subtribe 1. Eulophieæ.
" 2. Cymbidieæ,
" 3. Cyrtopodieæ.
" 4. Stanhopieæ.
" 5. Maxillarieæ.
" 6. Oncidieæ.
" 7. Sarcantheæ.
" 8. Notyileæ.

Tribe III. NEOTTIEÆ.
Subtribe 1. Vanilleæ.
" 2. Corymbieæ.
" 3. Spirantheæ.
" 4. Diurideæ.
" 5. Arethuseæ.
" 6. Limodoreæ.

Tribe IV. OPHRYDEÆ.
Subtribe 1. Serapiadeæ.
" 2. Habenarieæ.
" 3. Diseæ.
" 4. Corycieæ.

Tribe V. CYPRIPEDIEÆ.

—The Secretary read a short paper "On some Hybrid British Ferns," by Mr. Edward J. Lowe. The author records experiments which induce him to believe that it is possible to cross different species, as well as varieties of the same species.—"A Revision of the genus *Vibrissea*" was the title of a communication by Mr. William Phillips, which was taken as read.

Botanical News.

The Botanical Department of the British Museum has lately acquired a series of five quarto volumes of original drawings by John Miller, entitled "Drawings of the leaves, stalks, and ramifications of plants, executed for the Right Honourable the Earl of Bute for the years 1783 and 1784."

The University of Aberdeen has lately been presented with an interesting herbarium of British plants, numbering 1131 species, collected and named by John Duncan, an aged country weaver living near Alford, in Aberdeenshire. An interesting sketch of this remarkable man, who was born in 1794, will be found in 'Nature' for January 20. The plants are for the most part those of his own neighbourhood.

The herbarium of the late Robert Dick has been presented to the Free Library at Thurso; it is to be regretted that it has not fallen into the hands of some scientific institution.

Dr. W. Lauder Lindsay, the lichenologist, died at the end of last November at the age of 52, after an illness of many years' standing. His papers on Lichens, many of them carefully illustrated by the author, are well known; he was also the writer of others upon various points connected with the botany of New Zealand, some of which appeared in the earlier volumes of this Journal; his 'Popular History of British Lichens' is a useful little work.

We have also to record the death of Isaac Carroll, of Cork, of whom we hope to give further particulars shortly.

We are glad to learn that Prof. P. MacOwan, late of Gill College, Somerset East, has been appointed by the Cape Government to the directorship of the Botanic Garden, Cape Town.

Dr. S. B. Mead, an American botanist, died at Augusta, Illinois, on the 11th of last November, in his 82nd year,

Mr. Arthur Bennett, of 107, High Street, Croydon, is engaged upon a critical investigation of the species of *Potamogeton*, and will be glad to receive specimens, either British or foreign, for examination.

The Messrs. H. & J. Groves will be glad to receive specimens of *Characeæ*, more especially such as are extra-British; their address is 13, Richmond Terrace, Clapham Road, London, S.W.

Tab 217.

A. Bennett del. ad nat. J. N. Fitch lith. Potamogeton lanceolatus. Smith.

West, Newman & Co imp.

Original Articles.

ON *POTAMOGETON LANCEOLATUS* OF SMITH.

By Arthur Bennett.

(Tab. 217).

Considerable interest has always attached to this plant from the fact that it is not certainly known to occur elsewhere than in Britain. It is a species which has been much misunderstood by continental botanists,—partly, I am inclined to believe, on account of the scarcely satisfactory figure of the Welsh plant in 'English Botany.' The specimens which I obtained in the Fens last year (see Journ. Bot. 1880, p. 276), have enabled me to add a few details to Smith's original description; and I have thought that a figure prepared from the abundant material collected might serve to render the plant better understood, and at the same time afford an opportunity for publishing the following description of it, drawn up from living specimens:—

Potamogeton lanceolatus, *Smith*.*—'English Botany,' vol. xxviii., t. 1985; 'English Flora,' ed. 2, vol. i., p. 233. Hooker and Arnott's 'British Flora,' ed. 6, p. 469, 470. Bentham 'Handbook,' ed. 1, p. 493 (*lucens*, var.) Syme 'English Botany,' vol. ix., p. 34, t. 1405. Babington 'Manual,' ed. 7, p. 372. J. D. Hooker 'Student's Flora,' ed. 2, p. 394.

Non *P. lanceolatus*, Davall! Wolfgang! Reich.!

Nec *P. nigrescens*, Fries!

,, *P. variifolius*, Thore!

,, *P. panormitanus*, Bivoni!

Rootstock slightly creeping. Stem slender (usually naked below in the Fen plant), much branched. Submerged leaves mostly alternate, varying in length (1½ to 3 inches), linear-lanceolate, tapered gradually to the stem, less so to the apex, rather blunt, translucent, entire on the margin, with 3 to 6 ribs, connected by transverse, sometimes branched veins, and with chain-like network which is elongated along the midrib. Upper leaves oblong-lanceolate (variable), opposite, tapered into a slight petiole (especially in the Fen plant), subcoriaceous or translucent, with 7–9 ribs, and numerous cross veins, which are often branched; the whole leaf with chain-like network (areolation), more conspicuous towards the midrib. Stipules free, small subulate to linear, upper larger, lanceolate, not winged on the back, but with two strong ribs.

[* It seems right to point out that although this form of the name is that usually adopted, it was originally published by Smith as *lanceolatum*.—Ed. Journ. Bot.]

Peduncles $\frac{1}{2}$ to $2\frac{1}{4}$ inches in length, not thickened towards the spike, sometimes slightly stouter in the middle. Spike short, $\frac{1}{8}$ to $\frac{1}{4}$ inch, ovoid. Lamina of the sepals rhombic-orbicular. Ovary (very young) small, oblong-elliptical, rounded at the base with a slight neck at the base of the stigma.

Ripe fruit unknown.

The Fen plants give off stolons from the axils of the upper leaves, the leaves of which are very narrow, bright green, and translucent.

Loc.—Wales: in the River Lligwy, Anglesea. England: Burwell Fen, Cambridgeshire.

Mr. C. Bailey, of Manchester, gathered it in its Welsh habitat in August, 1875, and writes as follows:—"The plant grows in longish patches to the exclusion of anything else near it. In a few places where the stream is slower, and more water in, it simply fills it up, from the bed to the surface, so that the ducks cannot comfortably paddle in it; in the swifter places it is in the middle of the brook, forming patches of two to three yards long by six to twelve inches broad." Mr. Griffith again gathered it last November, and sent me fresh specimens; he added that he had detected a partly-formed fruit, and gave a sketch of it. I could only find a very young ovary, but certainly in a more advanced state than any I had before seen, although I have it from the Welsh station, gathered in August, September, October, and November. As I have it from the Fens growing I hope to get it to fruit; at this time the leaves are very narrow, very translucent, and of a beautiful bright green. As stated by Prof. Babington at p. 54, it is most certainly not the *P. nigrescens* of Fries Herb. Norm. or Mantissa. I sent specimens of our *lanceolatus* to M. Otto Nordstedt, of Lund, and he compared it with a specimen of Fries' plant, from the original station, and given to him by Fries himself; and he writes—"I do not think this is the same (identical) as *P. nigrescens*, Fries." He also kindly sent me a portion of that specimen, and from the structure of the leaf I have no doubt the original finder of the plant, Læstadius,* referred it to the species it is nearest, *P. rufescens*, Schrader.

I cannot help thinking that the 'English Botany' plate of *P. lanceolatus* has misled continental authors, being without ths floating leaves, and not representing the areolation of the leaves (which is regretted by Smith, Eng. Flor., vol. i., p. 233), which is well shown on some of the old specimens in the Herbaria of Kew and the British Museum. Placing that plate by the side of a specimen of *P. lithuanicus*, Gorski,† referred to his *lanceolatus* by Reichenbach, there is a general appearance of our plant on a large scale. In Nolte's collection at the British Museum are two incomplete specimens which so much resemble our *lanceolatus*, that it would be very desirable to obtain more complete specimens whence these came, *i. e.*, Holstein and Lauenberg.

---

* See Fries, Nov. Flor. Suec., p. 41.

† See Ascherson, 'Flora of Brandenburg' (Prussia), 1864, p. 656.

To the *P. variifolius* of Thore the British *lanceolatus* bears only a very superficial resemblance.

P. panormitanus of Bivoni, mentioned by Prof. Babington (Journ. Bot., 1881, p. 11), is a variety of *pusillus* with longer flaccid leaves than the type, the upper leaves spathulate, and having nearly the same chain-like network as *lanceolatus*. I possess British specimens (Westmoreland, Mr. C. Bailey), which match Bivoni's plant exactly.

I have specimens from the United States (which I owe to the kindness of the possessor of Dr. Robbins's Herbarium, the Rev. T. Morong, of Mass., U.S.A.), very like our plant at first sight, gathered by the late Dr. Robbins (who monographed the genus for Dr. Asa Gray's 'Manual'), and marked by him "*gramineus ?*" These are very like Fries's *nigrescens*, not only in the structure of the leaves, but in the peduncules and spikes; curiously enough no fruit has been found. Fries says* :—"Pedunculi elongata, sat tenues, æquales. Spica densiflora, elongata, cylindrica (nec elliptica; ut in *P. lanceolato*, Wils.)," and these American species agree well (some of the spikes are very slightly thickened in the middle); a leaf placed by the side of one of Fries's plants was undistinguishable under a low power, our British plant differing from both by the beautiful structure of its leaves. On one of the sheets of specimens at Kew is written in pencil "*P. diversifolius* non differt." I am unable to recognise the handwriting, and know of but one *diversifolius*, i. e., that of Barton (= *P. hybridus*, Michx.) I should be glad of information on this point, especially as to "*P. diversifolius*, Schl." which I am unable to trace. Chamisso, in 'Linnea,' vol. ii. (1827), p. 233, says of our plant :—"*P. lanceolatum*, E. B., t. 1985, est *P. lanceolatus*, species recognoscenda."

DESCRIPTION OF PLATE 217.—1. Specimen from Burwell Fen (ad nat. del.) *a*. Upper leaf. *b*. Portion of *a* to show the structure. *c*. Submerged leaf. *d*. Section of stem. *e*. Ovary (very young). *f*. Sepal (*d*, *b*, *f*, *e*. magnified). 2. Specimen from Wales.

NOTES ON THE HERBARIUM OF ABBOT,

WITH REMARKS ON THE SYNONYMY OF SOME OF THE SPECIES

By R. A. PRYOR, B.A., F.L.S.

(Concluded from p. 46.)

Geranium sanguineum. Correctly named (see p. 349 of Flora). There is a specimen of *G. rotundifolium*, which has since been found in the county; another (unnamed) of *G. nodosum* is possibly from Abbot's original locality at Welwyn.

G. pusillum. And not as in the Flora, *parviflorum*, correctly named.

Polygala vulgaris. The genuine plant.

There are un-named examples of both species of *Ononis*

---

* Mantissa iii., p. 17, 181; Summa, p. 214.

fastened to the same sheet, and apparently representing the "*arvensis*" and "*spinosa*" of the Flora. A question may be raised as to the proper names of these two plants. In the third edition of the 'Species Plantarum' (p. 1006) Linnæus has defined two species, the second of which, *O. repens*, is founded upon a maritime plant of Plukenet's, which is doubtless the same as the prostrate form of the sandy coasts of Norfolk and Suffolk, and is perhaps *O. maritima* of Dumortier. Omitting the somewhat vague habitat of the Orient, it is localised solely "*in Angliæ litoribus maris*," and it is quite clear that it could never have been intended to include the "*arvensis*" so general in inland situations. The other species, *O. spinosa*, with its primary variety *mitis*, is characterised, strangely enough considering the specific name, by "*ramis inermibus*." This has been almost universally identified with *O. hircina* of Jacquin, and is therefore beside the present enquiry. The second variety, *β. spinosa*, is distinguished "*caule spinoso*," a description which is curiously incorrect, as the spines can hardly be said to spring immediately from the stem, and is suggestive rather of the figure of Blackwell. It seems clear, then, that either Linnæus was unacquainted with the characteristics of the two species as now generally understood, or that he has confused them both under the last-mentioned variety. In the 12th edition of the 'Systema Naturæ' (vol. xii., p. 478), he has again described two species in terms verbally identical with those previously employed: the name "*spinosa*" only has been altered to "*arvensis*." What then is this last? Mr. Bentham has deemed, and there is every probability in favour of his opinion, that Linnæus simply changed the name "*spinosa*" to "*arvensis*," and that it was a mistake of Murray's to insert both as species in the 14th edition of the 'Syst. Veg.' It is sufficiently evident that the Linnean names cannot justly be applied to either of our plants. Hudson, in the 2nd edition of his 'Flora Anglica' (p. 312, 1778), appears to have been the first to have clear views of the distinctions now universally accepted. His first species, the *Anonis spinosa flore purpureo* of Ray's 'Synopsis,' he unfortunately referred to the Linnean *spinosa*; Mr. Bentham at one time considered it to be the *O. antiquorum* of Jacquin, a view that has since been given up, and *O. campestris*, Koch. & Ziz., correctly and generally adopted. His second species, *O. inermis*, includes two varieties, the first being the *Anonis non spinosa purpurea* of the 'Synopsis,' and the second the maritime plant above-mentioned. It will hardly be objected that O. *inermis* is occasionally spinous, and, with the exception of the Linnean, which I have endeavoured to show to be inapplicable, Hudson's is much the earliest name.

Lathyrus latifolius. Certainly *L. sylvestris*, L. The only specimen of *L.* "*latifolius*" in Sowerby's Herbarium is also, I think, undoubtedly *sylvestris*. The very narrowly-winged petioles and small stipules, and general appearance of the flowers, is quite unlike those of *latifolius*. The label "Hawnes and Bromham, Bedford, Sowerby MS.," is copied from Sowerby's note on the original drawing for E. B. 1108, which is of course *latifolius*, and does not in the least

resemble the specimen in question. This, however, agrees exactly with an unpublished drawing on which Sowerby has pencilled "*Lathyrus sylvestris*, by Rev. Mr. Sutton, Lord Eliot's wood, Sydenham in Essex, July 7th, 1792," a date earlier than that of either of the published drawings. There is no specimen from Bedfordshire in the Smithian herbarium.

Vicia lathyroides. Exactly Dickson's Hyde Park plant (Hort. Sicc. Brit. No. 12), and therefore *V. angustifolia*, Reich.*

Ervum tetraspermum. *Vicia hirsuta*, Gray.

Trifolium Melilotus-officinalis. *Melilotus altissima*, Thuill. (Fl. Par. 378). *M. officinalis*, Willd. (En. h. Berol. ii. 789).

Thuillier's name (1799) is ten years earlier than that of Willdenow, and besides Desrousseaux† had already (Lam. Enc. iv. p. 63) established a *Melilotus officinalis*, which has far more claim to represent the Linnean plant, although it has been usually called *M. arvensis* by British authors. This is the plant figured by Martyn (Fl. Rust. 72), and is not improbably that mentioned by Gerard as an abundant weed on the borders of Essex and Suffolk.

There is an unnamed specimen of *Trifolium medium*, Huds. Hudson (Fl. Angl. ed. 1, 289, 1762) is undoubtedly the authority for this specific name. It is true that it wili be found in the 'Novitiæ Floræ Sueciæ,' in the Appendix to the second edition of the 'Fauna Suecica' (1761); but "*Trifolium medium*, Linn. Faun. Suec. ii. app. p. 558 (solum nomen) manifesto a Linnæo in Sp. ii. ad *T. alpestre* (specie tamen diversum et in Suecia non obvinm) ducebatur, et propterea alibi apud L. non occurrit." (Richter, Codex Linnæanus, 744). I do not see, then, how we can call our clover *T. medium*, unless on Hudson's authority.

T. ochroleucum. *T. ochroleucon*, Huds.

In 1762, in the first edition of the 'Flora Anglica,' Hudson described and named for the first time *Trifolium ochroleucon*, founding his species upon the "Trifolium pratense hirsutum majus, flore albo-sulphureo, seu *ὠχρολεύκῳ*" of Ray (Syn. ii. 193), and characterising it as "Trifolium spicis globosis, corollis monopetalis, calycum infimo dente longissimo erecto, foliis cauleque hirsutis." There can be no possible doubt as to the plant intended by either writer. In 1768, in the 'Appendix Vegetabilium,' half a dozen pages of botanical matter inserted at the end of the third volume, on the Mineral Kingdom, of the 'Systema Naturæ' (ed. 12), Lin-

* It seems not improbable that this *Vicia* may never really have been gathered in Hyde Park (Fl. of Middx. 86), but that the admission of this station in the 'English Flora' was owing to some inadvertence or confusion of memory on the part of Smith. The first notice of Dickson's plant is to be found in Eng. Bot. i. 30, but the specimen was not published in the fourth fasciculus of the 'Hortus Siccus Britannicus' until some years later. The doubt as to the correctness of the name was perhaps first suggested in the third edition of Withering's 'Arrangement,' and in the 'Flora Britannica' Smith tacitly transferred Dickson's synonym to *V. sativa* L., without the mention of any locality. In the 'English Flora,' "Hyde Park, Dickson," is correctly given under the newly introduced *V. angustifolia*, and I cannot help thinking that the station was erroneously repeated under *V. lathyroides*, more especially as Smith does not refer to any authority.

† To say nothing of Lamarck himself (Fl. Fr. ed. 1, 595).

næus has also described a trefoil under the same name as, but without any reference to, Hudson, and based upon a plant introduced by Dillenius into his edition of the 'Synopsis,' as "observed by Mr. Rand between Peckham and Camberwell," and defined as "T. pratense purpureum minus, foliis cordatis. Priori [*T. pratense*] minus est, foliis parvis cordatis, leviter pilosis, floribus pro plantulæ magnitudine majusculis, capitulo nudo, petiolo modice longo insidente. Folia ad superiorem caulis partem plerumque ex adverso nascuntur, quod singulare in hac specie" (Syn. iii., p. 328). In all this what hint is there of any possible reference to *T. ochroleucum?* Nor will the figure (tab. xiii. f. 1) help out the resemblance, the stipules being especially unlike those of our plant. It is difficult to understand that any very definite meaning was attached by Linnæus to his own character—"T. spicis villosis, caule erecto pubescente, foliolis infimis obcordatis;" indeed, that of *T. squarrosum* (Sp. Pl. 1082) comes, as suggested by Smith, far nearer to the present species. Haller, indeed, refers Rand's plant to his *ochroleucum* as a variety, guided principally, it would seem, "*pare foliorum oppositorum*," but Linnæus, though he has copied some details from the description of the genuine Swiss plant, still *quotes* only the so-called purple variety, and, under any circumstances, Hudson's name has a clear five years' priority. It is characteristic that Smith has no reference to Hudson at all in the English Flora under this plant.

T. scabrum. Too immature to determine with certainty.

T. procumbens. No specimen.

T. dubium, Sibth. *T. minus*, Sm.

This last name is often quoted, especially by continental botanists, as if Relhan were the authority. The language of Smith, both in 'English Botany' and the 'Addenda' to the 'Flora Britannica,' is doubtless the origin of the mistake; but a reference to Relhan's own note in the second edition of his 'Flora' (p. 200) will not leave much room for hesitation, as it is only reasonable to suppose that Smith furnished the name as well as the character of the plant in question. After giving the description from 'cel auct. Flor. Brit. MSS.,' he adds, "Characteres trium ultimarum specierum, a cel. auct. Flor. Brit. ex observationibus D. Beeke, S.T.P. emendati fuerunt; et mihi benevole communicati." Sir J.D. Hooker's unqualified statement that *T. minus*, Sm., "is the *T. filiforme* of foreign authors" (Stud. Flora, p. 99) is in strange contrast with the opinion of Grenier, "Tout le monde étant maintenant d'accord sur la plante á laquelle Linné a donné le nom de *T. filiforme*, ainsi que sur l'identité de cette espèce avec le *T. micranthum*, Viv., je pourrais borner là le résumé de la discussion" ('Flore de la Chaine Jurassique,' p. 176). But the question as to *T. minus* is not yet finally settled. There is another claim that cannot in strict justice be overlooked. Sibthorp appears to have been the first writer in our own country to identify the *T. agrarium* of English authors with *T. procumbens*, L. As the plant formerly called *procumbens* was thus left without a name, he created for it that of *T. dubium*, and it so stands as a distinct species in his 'Flora,' p. 231 (1794).

Two years later Withering, in the third edition of the 'Botanical Arrangement' (1796), altered the *T. agrarium* of his earlier writings into *T. procumbens*, on the expressed authority of Afzelius, but without any reference to Sibthorp, his former *T. procumbens* ranking, on the same grounds, as *T. filiforme* (see p. 654). The same course was adopted by Smith in the 'Flora Britannica,' p. 792 (1800), and it was not until the second edition of 'Relhan' (1802) that he definitely introduced the three species with *T. minus* as a substitute for the six years earlier *dubium* of Sibthorp. There can be no doubt that both authors distinguished precisely the same plant, and Sibthorp's name, as the earliest and most expressive, has every claim to precedence, subject to the ultimate determination of the Linnean *procumbens*.

T. filiforme. Correctly named; but another specimen is *Medicago lupulina*, L.

Sonchus oleraceus. 1. *S. asper*, All. (Fl. Ped. no. 814).
2. *S. oleraceus*, L.

Hieracium murorum. *H. vulgatum*, Fr.

H. sabandum. *H. boreale*, Fr.

H. umbellatum. No specimen.

Arctium Lappa. No specimen.

Viola canina. *V. Riviniana*, Rchb.

Orchis latifolia. *O. incarnata*, L.

Serapias latifolia. *Epipactis latifolia*, Bab. Man. I am able to recognise three woodland species of *Epipactis* in south-eastern England:—

i. *E. latifolia*, Bab. Man.

ii. *E. latifolia*, Hook. Student's Flora.

iii. *E. violacea*, Boreau, Fl. du Centre, p. 651. Durand Duquesney Cat. Pl. de Lisieux, p. 102, sub *latifolia*. This "plante remarquable par sa souche épaisse, donnant naissance à une touffe de tiges, et par la teinte rougeâtre-violacée répandue sur toutes ses parties" (Brébisson, Fl. de la Normandie, ed. v. p. 396–7) can never be confounded when growing with either of the other species. "What botanist," remarks Mr. Oxenden in a communication addressed by Dr. Masters to the 'Phytologist' (n.s., v. iii. p. 268), "ever yet knew *E. latifolia* to throw up ten or a dozen flowering stems from the same root, each stem very close to the rest like ears of corn? but every one of these contingencies occurs with *E. purpurata*" (*violacea*). It is doubtless the *E. violacea* with "tufted not creeping" rootstock of 'Topographical Botany'; and I believe it to be the plant of Forbes, badly figured, and with a very insufficient description in E. B. S. 2775. It has of course nothing to do with the *E. purpurata* of Smith, which, as is sufficiently evident from the original specimen, was founded on a deformation in an immature state. I do not know how far it corresponds with the *E. media β. purpurata* of the 'Manual.' Specimens thus named many years back from Hertfordshire, under Mr. Babington's inspection, are certainly not this plant. *E. violacea* occurs in Bucks (Britten), and I have seen specimens from Hertfordshire, Hampshire and Northamptonshire. To these Bedfordshire may

be added on the faith of the E. B. S. plant, and probably Kent on that of Mr. Oxenden. I do not venture to quote any counties from 'Topographical Botany,' as Mr. Watson has referred to *E. media*, Bab., a most distinct plant as a synonym of his *violacea*. There is an excellent description of *E. violacea* in the third edition of Boreau's 'Flore du Centre,'* but I am unable to refer to any very satisfactory account of it in any British author, although the characters of the other two species are sufficiently clearly given in the 'Manual.' Dr. Boswell indeed has observed that "specimens of *E. violacea*, Durand-Duquesnay, from Lisieux, agree well with *E. purpurata*, Sm." (I presume the E. B. S. plant, and *not* that of Smith is intended), "but the French plant is said to have a thickened rhizome, producing tufts of stems, which I cannot verify from my specimens, which are only detached stems. The Reigate plant grows in dense tufts, but each stem, or at most each pair of stems, comes from a separate branch of the rootstock" (Syme, E. B. vol. ix., p. 124); and again, just above, "The Reigate and Claygate plants are the only ones I have seen in a living state. These are not at all tinged with purple, and have the flowers pale yellowish green, with the labellum sometimes as long as the calyx segments, but generally a little shorter." Mr. Watson, however, has taken a different view, and remarks that "Dr. Boswell Syme is under some error in recording that the Claygate plants of *E. media* 'are not at all tinged with purple.' On a label with a specimen dried in 1849, I wrote 'Whole plant with a lilac purple bloom over the green;' and indeed it was the purple tint which first drew my attention to the plant"† (Comp. Cyb. Brit. p. 577). But our plant was not unknown to the earlier botanists. In the herbarium of Buddle (Herb. Sloan. 124, fol. 43), are two unmistakable specimens of *E. violacea*, without locality, labelled "*An Helleborine montana angustifolia purpurascens*, C. B. 187." The original plant of Bauhin, and that of Ray's 'Historia,' was doubtless the *Cephalanthera* to which it has usually been assigned; but it is far from improbable that Plukenet's Irish specimen (Alm. p. 132) was the same as Buddle's. Hudson, in the first edition of his 'Flora,' p. 342, quotes Bauhin's synonym for his *Serapias longifolia* δ. which he localises "*circa* Clapham *et* Ingleton in *comitatu Eboracensi*."

---

* "*E. violacea* . . . Souche épaisse produisant des touffes de tiges sociétaires de 2 à 7 décim. cylindracées, sans angles ni stries, excepté au sommet, robustes, couvertes surtout dans le haut d'une pubescence papilleuse, pulvérulente brillante; gaînes des feuilles inférieures étroitement embrassantes; feuilles lancéolées aiguës, souvent plus courtes que les entre-nœuds, passant insensiblement à l'état de bractées linéaires lancéolées plus longues que la fleur; pédicelle tordu plus court que l'ovaire; ovaire turbiné à 6 fortes nervures; lobes du périanthe plus longs et plus ouverts que dans *E. latifolia*, les extérieurs verdâtres, les 2 intérieurs d'un blanc jaunâtre, lavé de rose; label très excavé à appendice cordiforme acuminé, un peu crénelé, recourbé à la pointe, offrant à sa base verdâtre des gibbosités plissées crépues, blanc sur les bords d'abord, puis rose et enfin brun. Toute la plante est d'un rouge violacé, à la fin bronzée, jamais verte."—Boreau, vol. ii. pp. 651, 652.

† I have myself gathered undoubted specimens of *E. media*, Bab., that were entirely of a bright lilac tint, in one instance varied with a primrose colour.

This could hardly have been *Cephalanthera rubra*. Stokes, in the second edition of Withering's Arrangement, similarly places Plukenet's and Hudson's plants as a variety with purplish flowers of his *Serapias grandiflora* (With. Arr. ed. ii. p. 1001), and as quite distinct from *S. rubra*. The variety as of *S. grandiflora* seems to be altogether imaginary, but the specimen of Buddle may go far towards clearing up this obscure plant.

Carex distans. *C. binervis*, Sm.

C. montana. This seems to be *C. pilulifera*, L.

C. panicea. *C. remota*, L.

There were also specimens, correctly named, of the following:—

C. pulicaris,	*C. sylvatica*,
C. pilulifera,	*C. strigosa*,
C. pallescens,	*C. riparia*,
C. præcox,	*C. hirta*,

And of some others which are not in the Flora.

C. cæspitosa. *C. vulgaris*, Fr.

C. recurva. *C. flacca*, Schreb., Spic. Fl. Lips. app. n. 699. *C. glauca*, Scop.

C. rostrata. *C. rostrata*, Stokes (With. Arr. ed. ii. 1059). *C. ampullacea*, Good. I cannot see why Stokes' name should be neglected in favour of the later one of Goodenough. The same locality is referred to by both authors, and the earlier description is unmistakable.

The other *Carices* mentioned in the 'Flora Bedfordiensis' are either not represented in the herbarium or are in quite an indeterminable condition. The same remark will apply to the *Salices*.

Atriplex patula. A stunted example of *A. erecta*, Huds.

It will be noticed that one or two of the specific names in the foregoing list, which are usually attributed to Linnæus, have been ascribed to the authority of Hudson. While engaged in the collation of synonyms for the Flora which I have in preparation, my attention has been forcibly drawn to the unmerited neglect which has befallen so many of Hudson's determinations. His first edition, indeed, with some honourable exceptions, seems to be entirely unknown upon the Continent, and has apparently been consulted by very few among British botanists, while we not unseldom find that even the second has for purposes of reference been superseded by the reprint of 1798. The 'Flora Anglica' was originally published in 1762; I have not been able to ascertain the exact date, but from a MS. note of Pulteney's he seems to have received his copy "ex dono authoris" on October 8th of that year. The preface to the first volume of the second edition of the 'Species Plantarum' is dated September 1st, 1762, but from a reference to Hudson at page 680, under *Prunus avium* and *insititia*, it is quite evident that at least the latter part of the volume could not have been printed off until after the publication of the 'Flora Anglica.' The second volume is dated 1763, and is clearly posterior to the work of Hudson, which indeed is quoted on several occasions. In addition to the names given above, and omitting those which are generally accepted, at least in this country, and a few others such

as *Blackstonia* and *Bromus ramosus*, whose claims have been recently brought under notice, and which are in the way to be generally conceded, there remain a dozen for which Hudson's nomenclature has the priority over that of Linnæus, who has indeed, in some cases, simply transferred the names of the 'Flora Anglica,' with a due acknowledgment, to his own pages, and can hardly be supposed to have intended that they should be quoted on his own authority.

The list is not an uninteresting one :—

Alopecurus myosuroides, Huds. 23. *A. agrestis*, L. Sp. ed. 2, 89. This can at most claim to be contemporary with Hudson's name.

A. bulbosus, Huds. 24. *A. bulbosus*, L. Sp. ed. 2, ii. app. 1665. With reference to Hudson.

Agrostis palustris, Huds. 27. *A. alba*, L. Sp. ed. 2, 93. Both names should perhaps give way to *A. stolonifera*, L. Sp. ed. 1, 62.

Avena pubescens, Huds. 42. *A. pubescens*, L. Sp. ed. 2. ii. app. 1665. With reference to Hudson.

Dipsacus sylvestris, Huds. 49. *D. sylvestris*, 'L.' Syst. Veg. ed. 14, 143 (1774). *D. fullonum*, L. Sp. ed. 1, 97, is perhaps more correctly the name of this plant.

Sium erectum, Huds. 103. *S. angustifolium*, L. Sp. ed. 2. ii. app. 1672. With reference to, and character copied *verbatim* from, Hudson.

Mentha longifolia, Huds. 221. *M. sylvestris*, L. Sp. ed. 2, 804. With reference to Hudson.

M. rotundifolia, Huds. 221. *M. rotundifolia*, L. Sp. ed. 2, 805. With reference to Hudson. These are the varieties β. and γ. of *M. spicata* in the first edition of the 'Species Plantarum' respectively.

M. hirsuta, Huds. 223. *M. hirsuta*, L. Mant. 81 (1767). With reference to Hudson, and a slight alteration in his character. Fries says (Summ. Veg. Scand. 197) that this is *M. nepetoides* of later writers. If this determination be correct, Hudson's two Middlesex stations must be transferred from *M.* "*hirsuta*" to *M.* "*pubescens*" of Trimen and Dyer's Flora, and will probably turn out to be the same as those of Rand and Buddle given under the latter plant.

Scutellaria minor, Huds. 232. *S. minor*, L. Sp. ed. 2, 835. With reference to Hudson, and his character given verbatim.

Geranium perenne, Huds. 265. *G. pyrenaicum*, L. Mant. 97 (1767).

Hypericum elodes, Huds. 292. *H. elodes*, L. Sp. ed. 2, 1106. This last, however, is to be found as a *solum nomen*, together with several others that were previously unpublished in the catalogue of the Flora Anglica put forth in Grufberg's name in the fourth volume of the 'Amœnitates Academicæ." These names, though referred throughout to the numbers of the Dillenian edition of the Synopsis, have never been taken up, and only one of them, *Veronica montana*, has been noticed in this relation by Richter in the 'Codex Linnæanus;' but as the volume in which they, as well as the two 'Centuriæ Plantarum' (where formal descriptions of

many of them will be found), occur, was not published until some months after the appearance of the tenth edition of the 'Systema Naturæ' (1759), in which they are mostly inserted, the point is, with respect to the greater number, of no particular importance. The *Hypericum*, however, is not so circumstanced, and the question may arise whether it ought not, strictly speaking, to be quoted as *H. elodes*, Grufberg.

The following are also in a similar position; they have been determined from the references to the Synopsis:—

Primula acaulis; seemingly as a species.
Vicia angustifolia: the plant of Bobart.
Trifolium squamosum: T. maritimum, Huds.
Medicago minima: and of Desrousseaux.
Ophrys arachnites: O. aranifera, Huds.

ON SOME RECENT TENDENCIES IN BOTANICAL NOMENCLATURE.

By B. Daydon Jackson, Sec. L.S.

From time to time it is good to compare our present methods of working, with those of earlier epochs, in the same way that a mechanic will occasionally test the truth of his operations, by reference to the original design or model, and so escape the errors which invariably attend the repetition of copies. The matters which are immediately before us should not be suffered to entirely engross our attention, and prevent comparison of our methods with those of our predecessors. The absence of proper retrospection has led to many regretable departures from established usages, often resulting in great inconvenience to methodical and conscientious investigators.

The chaos which threatened botanical nomenclature previous to the Paris Congress of 1867 was averted by the adoption of the code there promulgated; some botanists, however, remained unconvinced of the soundness of the decisions, and certain irregularities since then are traceable mainly to that feeling; but I think it will be readily granted that a recognition of the moderation and justness of the rules laid down prevailed almost unanimously upon their adoption. It was hardly to be expected that every possibly-occurring case could be foreseen and provided for; therefore, now and then, debateable points have come up for discussion and amicable arrangement. There are still other cases, where an author has started on his own track without raising the question previously, and hence has laid himself open to the charge of innovation; it is more particularly with this class of writers that the following remarks have to do.

It must be admitted at the outset, that the earliest *correct* name is to be used in connection with any given species. Anything short of an absolute rule on this head can only result in individual preference for certain names, and once admit the plea of

favouritism, and we at the same moment abandon firm ground for quick-sands. The only proviso is, that the prior name must be published in some work which either came into the market as an independent book or pamphlet, or as part of a serial publication. It matters not how obscure the publication may be, or how small the issue, provided that *bonâ fide* publicity was given to it; Linnæus's 'Hortus Cliffortianus' was a privately printed work, yet no one scruples to refer to it, if necessary; Sibthorp's 'Flora Græca' in its original form consisted only of twenty-three perfect copies, but its limited number does not shut it out from quotation. I refer to this, because the charge of pedantry is sometimes levelled at those who have honestly, and often laboriously, worked through the later incrustations, and arrived at the original and genuine name. The restitution of the name *Potentilla Sibbaldi*, Haller fil., in the 'Flora of British India,' as mentioned on p. 277 of this Journal for 1880, is a case in point; it would be captious criticism to complain that this name was published in an obscure publication, and therefore should be disregarded. It is the period of transition that is trying; let the original and true name be set forth once for all, and difficulties will vanish, but the attempt to uphold certain names because we are used to them must result in ultimate failure; it is an attempt to compromise with truth, a course that can end only in a heavier penalty at some future time.

I am pleased to see the critical article by Mr. R. A. Pryor (whose recent death we have to deplore) in the current number of this Journal (February, 1881); and if, as he says, the *Ranunculus sardous* of Crantz is the same as our British plant, the later names of Curtis and Ehrhart must fall,—there is no help for it.

No plant can be considered as fully named, unless, in addition to the generic and specific names, is given that of the author of the name as quoted. M. Alph. DeCandolle goes straight to the heart of the matter, when he lays down the rule, NEVER TO MAKE AN AUTHOR SAY WHAT HE HAS NOT SAID (Bull. Belg. xv., 1877, p. 482). This is a golden rule, although often disregarded. Acting upon this common sense dictum, such a citation as "*Mathiola incana*, Linn., sub *Cheiranthо*," is preposterous and inadmissible; if given in full it is cumbrous, and includes a misstatement; if shortened, by omitting the last two words, it is absolutely false, because Linnæus designated that species *Cheiranthus incanus*, and could know nothing of Brown's genus *Mathiola*. This is now generally allowed, and some who followed M. Boissier in attaching greater importance to the specific name rather than to the generic, are now convinced of the soundness of the decision given as above by M. DeCandolle. The notion that due honour must be given to the original author of the species, by attaching his name to it, however changed it may in time become, is sheer nonsense; we do not write *L.* or *R. Br.* as a tribute of respect to the memory of those authors at all, but for our own sake in making clear our meaning. This brings me to the case of those authors who admit quite frankly the cogency of the reasons for following the procedure above-mentioned, but, nevertheless, in their practice go very far astray. "*Biscutella*

californica, Benth. & Hook. Gen. i. 91," and "*Braya Eschscholtziana*, Benth. & Hook. Gen. i. 83," as quoted by Sereno Watson in his splendid 'Bibliographical Index,' are simply examples of mistakes; the genera *Dithyrea* of Harvey and *Aphragmus* of Andrzejowski having been sunk by the authors of the 'Genera Plantarum,' does not qualify them for citation as the authority for the species, because they have not spoken of these plants by the names under which they are here ranged.

To show how readily errors accumulate, when sufficient care as to accurate citation is not forthcoming, I think the following chain of instances, which Mr. Britten first pointed out to me, remarkably instructive. In the 'Student's Flora of the British Islands,' ed. 2, at page 63, under the heading *Arenaria* will be found this statement:—"*A. Cherleria*, Fenzl (sub *Alsine*);" this sentence also occuring in the first edition at page 60. This work is usually regarded as a digest of Syme's* edition of 'English Botany,' and Sir J. D. Hooker readily acknowledges his indebtedness to it. But it would seem that too great reliance has been placed on Syme's synonymy, a point on which that work is particularly open to criticism. Tracing back, we find in vol. ii. of that book, p. 108, "*Alsine Cherleria*, Fenzl." In Grenier and Godron's 'Flore de France,' vol. i., p. 283, Grenier, who alone is responsible for that portion of the book, says:—"*A. Cherleri*, Fenzl," giving Endlicher's 'Genera' as the authority for that name; referring to the 'Genera,' p. 965, we find that Fenzl established the section *Cherleriæ*, but named no species. Summing up, and sweeping away the accumulated blunders, the case stands thus:—

§ *Cherleriæ*, Fenzl, in Endl. Gen. 965.
Alsine Cherleri, Grenier, in Gren. & Godr. i. 283 (1848).
A. Cherleria, Syme, Eng. Bot. ii. 108 (1863).
Arenaria Cherleria, Hook. fil., Stud. Fl. 60 (1870).

It is natural that an author, when describing a new species of a large genus, should indicate the section to which it is most akin, for instance, *Astragalus* (§ *Hypoglottis*) *immersus*, Baker, but these three names are never meant for constant use, unless the mycologists will have their own peculiar way in the unwieldy genus *Agaricus*. The following, therefore, is open to reproach on this account alone:—"*Gunnera* (*Pankea*) *insignis*, Oerst.;" but that is not the worst of it. At first glance it has a similar aspect to the example just above it, and that the author means to say the *Gunnera insignis* of Oersted belongs to the section *Pankea*, but somehow has missed inserting the section sign §. The use of parentheses is to temporarily exclude from the main

* It is manifestly wrong to speak of "Boswell's edition of 'English Botany'" (*op. cit.* Preface), since the surname Syme was not abandoned until after that work was finished. The title page of the first volume must be held as the true authority in such cases; we constantly speak of Sowerby's 'Botany,' and rightly so, for Smith's name did not displace Sowerby's on the title page until the fourth volume was completed. Smith was very angry with those "who flippantly quoted Sowerby's 'Botany,'" but they were right and Smith was wrong; he had only himself to blame in the matter.

sentence all the words within their boundaries; the general sentence should be complete in significance and intention without reading the parenthetical portion; this is the literary, the universal, acceptation of parentheses. Tried by this standard, the last example is wofully erroneous; Oersted, in the 'Videnskabelige Meddelelser' for 1857, described *Pankea insignis*, which *might* be inferred from the quoted statement, but is by no means clearly set forth.

When quoting names, I consider it wholly unnecessary to point out also the author who first discriminated the species; thus, if treating of *Andreæa*, I object to a citation like this—"*A. alpina* (Dill.), Sm." It is the *A. alpina* of Smith; Dillenius gave as its names—"Lichenastrum alpinum atro-rubens teres calycibus squamosis." The history of the naming of the species can be clearly shown in the synonymy, and if the student is too lazy to glance even over the synonyms, *à fortiori* he will not burden his memory with two authorities.

Another very objectionable practice, which has only recently assumed prominence, and should be discountenanced at once, is that of altering, under the guise of amending, a name given by a previous author, and then quoting that author as the father of the changeling. This seems like the pedantic spirit breaking out in a new form; it is clearly a violation of good faith, so to change a name that even its parent would disown it. Cases may occur where a misprint in the original may be palpable; *Juncus lampocarpus*, Ehrh., is usually written *J. lamprocarpus* on this account, but any such practices must be jealously watched. To propose the alteration of *Weissia* to *Weisia*, because *sometimes* F. W. Weiss omitted the second s from his name, is mere pedantry. But as an instance of the habit I am reprobating, take "*Andreæa crassinervis*, Bruch." Here we have a specific name which Bruch did *not* coin, for on turning to his original memoir in the 'Abhandlungen der math.-phys.-Classe,' München, i. (1832), p. 279,* we find the adjective *crassinervia*. I know that this alteration is ostensibly defended by the plea that no such adjective as "crassinervius, a, um," can be found in the Latin dictionary. Truly, not even the great works of Forcellini, Freund, or Ducange contain it; therefore, as it is neither classical nor even mediæval Latin, the precise shape given to it can matter very little, and the originator of the word was quite free to please himself therein. The strength of the argument for altering is still further attenuated by the fact that Carl Mueller has used the term "Enervia" as a sectional distinction (Synopsis Musc. i. p. 22), so this ending, having been in use altogether unchallenged for half a century, it is matter for regret that any attempt should have been made to supersede it. Smith was also guilty on this count, as the following will testify:—"*Arenaria trinervis*, Linn.," is a name which may be seen in nearly all British Floras—Babington, Bentham, both the Hookers, and Syme. The simple fact is that Linnæus in both editions of his 'Species plantarum' wrote

* Lindberg, in 'Journ. Linn. Soc. (Botany),' xi, (1870), p. 460, quotes the 'Denkschriften' in error; they ceased in 1824.

trinervia, and not until the time when Smith published the first volumes of his 'Flora Britannica,' do we find any variation. Smith cites the following botanists as using his name, but they all witness against him; Linnæus, Hudson, Withering, Relhan, Sibthorp, Abbot, Curtis, Willdenow, Allioni, and Oeder. Smith gave no hint of his tampering with the Linnean name, and so Withering was led astray in his subsequent editions, then Hooker in the 'Flora Scotica,' and a host of followers.

An error of still greater proportion occurs as "*Georgia Brownii* (Dicks.), C. Muell." Briefly, the history of the species is thus:—Dickson first figured and described the plant as *Bryum Brownianum;* it has successively been ranked under the generic names of *Orthotrichum*, *Grimmia*, *Tetraphis*, *Tetrodontium*, and *Georgia*. Hitherto the specific name used first by Dickson had been preserved, but the author of a recent work, wholly misapplying some remarks of Lindley, which were directed to *giving*, not altering, commemorative names, has chosen to transmute the specific name into *Brownii* as above. This act is hard to reconcile with the same writer's protest a few pages previous:—"An author is not at liberty to change a specific name, on transferring it to a new genus, nor to supersede by a new name, one previously published, even by himself." To ascribe the genitive of the noun, *Brownii* to any antecedent writer is positively misleading; the name should stand as *Georgia Browniana*, C. Muell., or *G. Brownii*, Braithw., if it must be altered, although I cannot see the slightest necessity for any such meddling with it.

I have not done with the cryptogamists yet. For instance, *Bartramia crispa*, Bridel, was so named in 1798 (Musc. rec., ii., pars. iii., tab. 1, fig. 4), and *B. pomiformis* by Hedwig in 1801 in the 'Hanover Magazine.' The former has been for some time considered a variety not meriting specific distinction apart from *B. pomiformis*. Prof. Lindberg, I understand, now considering *B. crispa* the more highly developed form, would constitute that the type, and sink *B. pomiformis* as a variety. If acute discrimination achieve no better result than this, I should lament its mischievous tendencies; who is to decide with indisputable authority the relative higher or lower rank which each species is henceforth to hold? By allowing fancy and inclination a voice in deciding such questions as these, we should be placing power in the hands of any Rafinesque or Salisbury to upset the labours of their less flighty fellows. I do not condemn the supercession of the latter name; the fact is right, but the reason given is wrong.

One more example of a false citation must close this part of the subject. Bridel described a variety of *Buxbaumia aphylla*, which he termed var. *viridis;* mark, only a variety. Subsequently he raised it to specific rank, under the style of *B. indusiata*. Now it is perfectly clear that Bridel christened his species *indusiata*. In spite of this, we find this statement put forth, "*B. viridis*, Brid." Surely it is an unhealthy and morbid activity to misrepresent earlier writers thus; common sense recoils from it.

As if to supply me with additional matter for comment, the

second edition of 'The London Catalogue of British Mosses and Hepatics,' &c., has just reached me. Nearly all the faults I have reprobated in the foregoing lines are here set forth in a glaring fashion. I will take a few as a sample of the many. "*Dichodontium pellucidum*, L." How could Linnæus refer any species to Schimper's genus? "*Dicranella varia*, Hedw." Hedwig had long ceased to be ere Schimper's *Dicranella* was published. "*Seligeria Doniana*, Sm.," will not do; did not Smith call it *Grimmia Doniana?* See 'Fl. Britannica,' vol. iii., p. 1198 (1804), so that the specific name even is not true; Bruch and Schimper published their genus *Seligeria* years after Smith's death.

"*Barbula unguiculata*, Dill.," is terrible, far worse than to quote the 'Hortus Cliffortianus' (1737), as the authority for *Conocarpus erecta*, as is done in another book. I must refrain from giving more examples from this abundant storehouse; every name as cited above is absolutely misleading, not one of these writers having used the generic and specific names as coupled here.

Minor faults in this list are quoting "Wils." and also 'Bry. Brit.;' did not Wilson write the 'Bryologia Britannica' as Schimper did the 'Bryologia Europæa'? both "Schpr." (for animadversions on this way of shortening authorities see below), and 'Bry. Eur.' surely are not wanted: "Ferg." and "Ferguss." for the same man testify to some amount of carelessness in proof-reading; a good reader would secure uniformity for the author in such matters. "Lindbg.," for Lindberg should be expanded so as not to be confounded with Lindenberg. The affectation of accuracy, accompanied by real inaccuracy, in the following quotation is very irritating:—

"Conocephalus, Necker (1790). *Hepatica*, Mich. 1741; *Fegatella*, Raddi, 1818). . . . . 3. [*C.*] *conicus*, L." Linnæus seems to have called it nothing else than *Marchantia conica*.

This is something worse than writing "*Potamogeton lanceolatus*, Sm.," for Smith, considering the generic name as neuter, wrote *lanceolatum*, and if we use his name we must do so too.

My last example shall be the most recent; on page 35 of the number of this Journal for February, 1881, there is a description of "*Lejeunea ulicina*, Tayl." Taylor, as shown in the very next line, termed it a *Jungermannia*.

I am quite aware of the ready retort which the authors of these assertions may use, but as I have stated my case in sufficiently plain terms, I there leave it. The state of things must be deplorable which could cause Mr. Bentham to write:—"The genera of ferns have been thrown into such confusion and uncertainty, that pteridologists acknowledge a right of priority in specific names whatever may be the genus under which they may have been first published" (Flora Australiensis, vol. vii., p. 699). At first sight this sentence reads as if anarchy having reigned so long, laws need not now be obeyed; but I do not take this to be its meaning. I understand Mr. Bentham to say that on transferring a fern from one genus to another, the old specific name is always to be retained as a sort of help to the memory; in fact, greater tenderness

than usual is to be shown. If, however, the opposite view be intended, then I must emphatically protest against such lawless action; if cryptogamists have offended so grievously in the past, it is worse than weakness to condone the offence, and so to pardon a continuing breach of the admitted rules.

The next topic I touch upon again requires us to hark back to the practice which Linnæus set and followed in his books; I allude to the uses of capitals in specific (or, more correctly, trivial) names. In the original specific names such as Linnæus employed in the 'Hortus Cliffortianus,' I cannot recall one instance of a capital letter being employed, but the reason is obvious; these names were only revised descriptions, in brief Latin sentences purged from the references to other plants which Linnæus condemned and did not at first practise. But an examination of the 'Pan Suecus,' where the present form of specific names was first adopted throughout, we find capital letters to very many names. The usage of Linnæus herein practically declares itself within the first dozen names, *Veronica Anagallis*, *V. Beccabunga*. *V. Chamædrys* occurring together in a group. To compress the matter into small compass, the great master made use of a capital when he took his trivial name from a name given by some previous author; the three given a few lines above were generic names according to the herbalists of a previous day; this was undoubtedly his guiding rule, and when he did employ a substantive for the second term he clearly marked it as such by a capital letter, whilst adjectives took their proper place without that mark.

Adhering, therefore, as closely as we can to Linnæus's plan, it is tolerably clear that a capital letter must be used in the following cases:—

(a.) An old generic name, *e. g.*,
Crassula Cotyledon, Haw.; *Galium Cruciata*, Scopoli; *G. Mollugo*, L.; *Andromeda Polifolia*, L.

(b.) A native name, *e. g.*,
Cassia Canca, Cav.; *Myrsine Manglilla*, R. Br.; *Eugenia Chekan*, DC.

(c.) A substantive used instead of an adjective (an uncommon case), *e. g.*,
Eucalyptus Globulus, La Bill.

(d.) A substantive used in the genitive case, *e. g.*,
Pyrethrum Halleri, Willd.; *Rosa Monsoniæ*, Lindl.; *Podophyllum Emodi*, Wall.

(e.) A substantive used adjectively in commemoration, *e. g.*,
Salix Russelliana, Sm.; *Grimmia Donniana*, Sm.; *Malva Boryana*, DC.

All other names must begin with a small letter, as adjectives, even if derived from places or other genera, *e. g.*,
Collomia gillioides, Benth.; *Tanacetum crithmifolium*, Linn.; *Anemone ranunculoides*, L.

In this last case Linnæus seems to have been somewhat inconsistent. These rules have been practically observed from the date of the first edition of the 'Species Plantarum' (1753) till now, with

some few exceptions, which go to prove the rule. At the present day the zoologists have adopted the plan of using no capital letters whatsoever in their specific names, and their example has unfortunately been extended into the botanical portion of Godman and Salvin's 'Biologia Centrali-Americana.' I am aware that the excellent botanist who has charge of this department is not lightly to be blamed in this matter; he had to conform to the zoological scheme which will form the largest portion of the work. Nevertheless, such names as "*Mamillaria schelhasii*, *M. schiedeana*, *M. seidelii*, *M. seitziana*," and so on, offend the sight of those accustomed to better methods, and can win no adherents to such a system. It reminds one very forcibly of the two Australian rascals, "mephistopheles with a little m, and brutus with a little b," sketched by Mr. Charles Reade in his novel, 'It is Never too Late to Mend.' These examples remind me that Haworth's genus should be written *Mammillaria* (Pl. Succ., 177). Reichenbach in 1827 seems to have led the way in misspelling it, and Bentham and Hooker do so in the 'Genera.

On one point I venture to differ from Linnæus in favour of modern procedure, and that is in such cases as, *Scandix Pecten-Veneris* and *Asplenium Ruta-Muraria*. The specific epithet here being composed of two words, the use of a hyphen is eminently desirable. I am here counselling the use of the names given in the 'Species Plantarum,' for the 'Pan Suecus' must be regarded as a sort of stepping-stone to better things; e. g., *Chenopodium Henricus* and *Hydrocharis Morsus*.

Pythium De Baryanum is too monstrous to pass in that form. *Debaryanum* or *Baryanum* if you please; either combine the preposition with the following noun or discard it, as in *Vanheurckia*, Bréb., or *Candollea*, Lab.

The last item in my present communication is on the ill-advised abbreviations used by certain writers from whom one would expect better things. Once more to quote M. Alphonse DeCandolle, *Hook.* is the proper abridgement for Hooker, and not the cabalistic *Hkr*. Initials should be carefully avoided, L. and DC. being too well known for any possible mistake, and consecrated by long habitude, excepted; combinations of initials also should be eschewed; two wrongs do not make a right, and if one cannot stand alone, it ought not to be fagotted with others to mutually support each other. S. & M. for Sebastiani and Mauri, M. & K. for Mertens and Koch, O. & H. for Oliver and Hiern, and K. & K. for Karelin and Kirilow, are essentially vicious modes of abbreviation. H. & T. has frequently been used for Hooker and Taylor's 'Muscologia Britannica,' whilst H. f. & T. means Hooker [fil.] and Thomson's 'Flora Indica:' two entirely different sets of authors are here to be kept distinct by the single letter f. If authors are too hurried or slovenly to take the necessary pains to write their copy fair for the printer, the latter should be instructed to expand it to the legitimate form. "Web. Mohr." and "Kar. Kir." need the sign & to complete the reference. I have instanced the example of zoologists as only to be shunned; their rules do

not run on the same line as do ours, and reform is hopeless in their case.

I may mention that a contemporary zoologist is using for his own species the initial W., which fifty years ago was understood to mean nothing but Willdenow, but which practical good sense now writes *Willd.*

For further examples of the mischievous method of abbreviating author's names, see M. DeCandolle's 'La Phytographie,' pages 272–278, where will be found remarks of weighty significance. I need not say how full of important matters that volume is, but many of the writers whose deeds I have censured will bow to M. DeCandolle's judgment, whilst they might dispute the views here set forth were they unsupported.

ON SOME MOSSES COLLECTED IN IRELAND.

By David Orr.

Having entrusted to Professor Lindberg, of Helsingfors, a large number of Mosses which I had myself collected in different parts of Ireland, I have lately had the pleasure of receiving from him a list, in which he gives his identification of all the species in my collection. Among them I find five species and three varieties not hitherto included in any work with which I am acquainted on British Mosses, viz. :—

Ceratodon conicus, Sch. On the sandhills of the North Bull, Dublin.

Bryum Mildeanum, Jur. About Kilrock Quarry, Howth.

Schistophyllum Orri, Lindb.* Rocky slopes in Ballinascorney Glen, Co. Dublin. This I have frequently distributed under the name of *Fissidens adiantoides*, Hedw.

Campylopus paradoxus, Wils. Crevices of rocks, south side, near the summit of the Hill of Howth.

Racomitrium obtusum, Br. Dublin Mountains ; not uncommon.

R. obtusum, var. *subsimplex*. With the former ; not rare.

Didymodon cylindricus, B. & S., var. *Daldinii*. Torc Mountain, Killarney.

Hypnum molluscum, Dill., var. *robustum*. Mangerton Mountain, Killarney.

Besides the above, not hitherto recorded as British, Professor Lindberg finds among my specimens the following five species new to Ireland :—

---

* [This is fully described by Prof. Lindberg in the 'Revue Bryologique' for 1880, pp. 97–99. He gives the locality as follows:—"Hibernia, in aggere limoso-arenoso juste Finglas Bridge, ad Tolka-river, haud procul Glasnevin Gardens in vicinitate boreali-occidentali nobis Dublin (1854, David Orr, n. 78, ut '*Fissidens viridulis ?*')" We learn from Mr. Orr that he found the moss in two localities at Glasnevin—"on stones in the bed of the River Tolka, which are left dry in summer ;" and "at an old quarry on north bank of the Tolka east of the Botanic Gardens." There seems some probability that the plant may have been accidentally introduced in its Irish localities.—Ed. Journ. Bot.]

Dicranum Starkii, Web. & M. Wet rocks near the top of Powerscourt Waterfall.

D. circinatum, Wils. In the wood on south side of Powerscourt Waterfall.

Timmia norvegica, Zett. Among crags on the west side of Lake Luggislaw, Co. Wicklow.

Orthotrichum Shawii, Wils. On an alder tree at head of Ballinascorney Gap, Co. Dublin.

Hypnum giganteum, Brid., var. On wet spongy spots on the Sutton side of Howth.

MR. DARWIN'S DOCTRINE OF CLEISTOGAMY.

By S. Le M. Moore, F.L.S.

At page 343 of his 'Forms of Flowers' Mr. Darwin argues with regard to cleistogamy, that "if a plant were prevented either early or late in the season from fully expanding its corolla, with some reduction in its size, but with no loss of the power of self-fertilisation, then natural selection might well complete the work and render it strictly cleistogamic." The examination of a very small female flower of a vegetable-marrow grown in the open air, has led me to dissent from this conclusion.

This flower was about two and a half times smaller than is usual with the species. All its parts were equally reduced; the lobes of the calyx were a little unequal, as also those of the corolla, which was much paler in colour than is usual. There was nothing to remark about the styles and stigmas, except that the former were rather more deeply separated and the stigmatic papillæ smaller than in the type. The ovules were normally developed, and the only other point observed was the fewer and weaker hairs on the ovary of the dwarf. Two flowers intermediate in all their characters were also observed.

I was greatly struck with the extremely small size of this flower, the difference between the two forms being much greater than in some undoubted cases of cleistogamy, accompanied by reduction of parts. Whether, however, it shows a tendency to cleistogamy, I know not; if it does, then the only case at all similar is the *Hoya carnosa* mentioned by Mr. Darwin (*l. c.* p. 331), which was supposed to have been fertilised without floral expansion and production of stamens. But in a review of Mr. Darwin's work (Journ. Bot. 1877, p. 376) I pointed out that there was only too much reason for the belief than an unfortunate blunder had been committed in this case. I may also remark that there is no reason to suppose that the lateness of the season is a sufficient cause for the appearance of the dwarf, as not only were flowers of the ordinary size produced at the same time, but the plant was a healthy one engaged in the task of ripening marrows.* It was the

* None of these marrows came quite to perfection, and the cold weather of October soon killed the plant, so that the small flowers were, I suppose, due in great measure to the lateness of the season. But this does not lessen the validity of the view here maintained.

resemblance in many respects to a cleistogamic flower that led me to notice what I thought might be a peculiarity due solely to the separation of the sexes—namely, the expansion of the corolla—and I reasoned in this way. We know that the first external sign of fertilisation is withering of the floral envelopes or petals; also that if pollination of an expanded flower is prevented, the perianth remains fresh for some time, a fact so well recognised that the gardeners at Kew are forbidden to apply the pollinia of the Orchids to their stigmas. We are, therefore, justified in concluding that the effect of fertilisation is to cause immediate cessation of the vitality of the envelopes or petals in correspondence with the cessation of their function; consequently, if any flower were fertilised before expansion, we should expect that the further development of the envelopes or petals would remain in abeyance. Let us see whether this view is not more consonant with a rational interpretation of facts than Mr. Darwin's.

First, bearing in mind the necessity which every plant is under of being at least occasionally crossed in its fertilisation, we should expect sometimes to find within the limits of a species or genus three forms of flower: one adapted to cross-fertilisation alone; a second cleistogamic, with reduced organs; and a third—as witness to the differentiations undergone—either cleistogamic with unreduced organs, or open but capable of self-fertilisation. I am not sure whether this has been observed with a species; but the late Mr. J. Scott, a few years ago, published some notes upon species of *Eranthemum* (Journ. Bot. 1872, p. 46), which he showed to be trimorphic, the largest flowers being quite sterile, the intermediate occasionally self-fertile and readily cross-fertilised, and the smallest closed and perfectly fertile. Now, unless some error crept into the case of the largest flowers, and it is very difficult to think that an apparently perfectly organised flower is incapable of reproduction, Mr. Scott's cases are not in point; neither do I know anything further of *Campanula colorata* than the mere statement of the fact that it bears flowers intermediate between open and closed (Darwin, *l. c.*, p. 330). There is, however, the genus *Viola*, which answers all expectation. Instead of the closed flowers, so familiar to everybody, *Viola tricolor* bears small open ones with a modification of the stigmas, rendering them autogamic. This plant is in fact a synthetic type. The small open flowers of the species are relics of the antedimorphic condition of the genus. At some period, but under conditions which it is impossible to dogmatise upon, it would appear that trimorphism set in, afterwards followed by dimorphism by the elimination in some case or cases of the closed flowers, and in another or others of the intermediate ones. Every other difficulty will vanish if we suppose that, at the time the genus contained trimorphic individuals, it comprised but two species, the descendants of which retained the special dimorphism of their ancestor. That this is no extravagant supposition will, I think, be generally admitted; but there is an alternative view. According to this *V. tricolor* and its allies may never have produced closed flowers, cleistogamy having affected only the other section by

conversion of the small open flowers into closed ones, and this was probably consequent upon the liability of the larger flowers to fail in their fertilisation, a failure which they have retained to this day. Upon this supposition the genus was never truly trimorphic, but only dimorphic. How is it possible to explain this case by the aid of Mr. Darwin's doctrine ? Some people may say " the species of § *Nomimium* are spring flowerers, whereas *V. tricolor* is of the summer. By unfavourable weather which prevented the growth of the envelopes but was not prejudicial to the reproductive organs, the spring flowers were rendered cleistogamic, reduction of parts being then brought about by natural selection. It is obvious that the summer-flowering species would not produce closed flowers." This is extremely plausible; but I may remark that *V. tricolor* lasts much longer towards autumn (September) than its congeners, and that it is not far behind them in the spring. Further, that many cleistogamic species produce their closed flowers in the summer. The objection to this will be that the summer development of closed flowers is an adaptive modification. Granting this to be a valid objection, it becomes necessary to treat the hypothesis in the only way in which it is possible to refuse assent to the whole body of Spinoza's philosophy, namely, by questioning its premises. The only unfavourable conditions which can prevent the maturation of the perianth are cold and wet. By what experiments, then, has it been established either as a rule or as an exception, that phanerogamous plants, prevented either by cold or wet or both from expanding their flowers, may suffer no baneful effects in their fertilisation ? That such is the reverse of the truth is a matter of universal experience; in fact it was only the other day that Mr. Hart in these pages (Journ. Bot. 1880, p. 306) expressed his belief that, owing to the ungenial climate, the plants of high latitudes cannot ripen their seeds, the whole of the phaner ogamic vegetation being of a perennial character. But further comment is useless, as the doctrine immediately collapses when questioned in this way.

I believe, then, that cleistogamy is caused by the physiological condition of great fertility without crossing co-existing with the morphological one of germination of the pollen while still within the anther-cell, or at least before expansion of the perianth. The result of the latter condition is arrest of the floral envelopes, which remain in position until separated or pushed up by the enlarging capsule. This doctrine seems simple enough, and at the same time fully accounts for the phenomena in question; all we have to suppose is a peculiar heteromorphism, certainly not greater than that of *Anguloa* and *Lycaste* on the same stem, of *Catasetum* and *Myanthus*, of the two forms of *Scilla* (*Drimia*) *floribunda*, of several species of *Eranthemum*, and many other instances. On the other hand, by adopting it, we escape from the dilemma of ascribing to an agency or agencies hostile to reproduction, the origin of a form of it betraying so astonishing an amount of vitality.

ON *ERYTHRÆA CAPITATA*, WILLD.

By Frederick Townsend, M.A., F.L.S.

Since my notice in this Journal for November, 1879, of a remarkable *Erythræa* from the neighbourhood of Freshwater, in the Isle of Wight, I have had the opportunity of comparing it with an authentic specimen of *Erythræa capitata*, Willd.; and I have lately stated, in a more extended notice read before the Linnean Society, December 2nd, 1880, that I have come to the conclusion that Willdenow's plant and that from the Isle of Wight form two varieties of the same species, with the following characters. I defer heading the varieties with a specific character, in the hope that future opportunities may enable me to draw up a more perfect one than I could now give.

E. CAPITATA, *Willd.*, var. *α. sphærocephala*.—Caule (¼–3 poll.) plerumque simplici et solitario erecto subangulato, foliis rosulatis ovatis ovato-oblongisve spathulatis obtusis 3–5 nervatis, foliis caulinis paucis connatis angustioribus, floribus subfasciculatis in capitulo dense congestis sessilibus numerosis cum bracteis obtusis intermixtis, bracteis exterioribus flores æquantibus vel superantibus, calyce corollæ tubo æqualii, filamentis in imo tubi corollæ insertis, stylo obliquo, quadranti parte ovarii sub anthesid exserto, capsula calycem excedente. (1) vel (2). In pascuis apricis.

On the downs of Freshwater, Isle of Wight, and Newhaven, Sussex. July and August.

Caulis sæpe in superiori parte ramum nudiusculum unum alterumve capitulo terminatum emittet.

Var. *β. Willdenowiana*.—*E. capitata*, Willd. Bracteis acutis, laciniis calycis angustioribus, laciniis corollæ angustioribus et acutioribus. "Latet locus natalis."

The earliest description of *E. capitata* is the following, given by Chamisso:—"*Erythræa capitata*, foliis elliptico-lanceolatis obovatisque tri et quinque nervibus sessilibus fioribus capitatis bracteatis. Willd. Species notabilis, inedita, ex herb. celeberrimi viri. Planta semel sed copiose a phytopola adlata rursus haud reperta est. Latet locus natalis." Cham. 'Adnotationes quædam ad Floram Berolinensem,' p. 9 (1815). The longer description given in Rœmer and Schultes's 'Syst. Veg.' was probably written by the elder Schlechtendahl, who took care of his friend Willdenow's herbarium, and sent many notes to Schultes on "Reliquiæ Willdenowianæ."

The true *E. capitata*, Willd., is wanting in Willdenow's herbarium, and the only specimens preserved are in the "Herbarium Generale" at Berlin.

Since Willdenow's time the plant has not been found, and it appears that a *capitate form* of *E. Centaurium*, Pers., has been taken for *E. capitata*, Willd., and is described in Floras as *E. Centaurium*

var. *capitata*, Rœm. & Sch. One of the most marked features in *E. capitata*, Willd., is *the nearly free filaments*, which, instead of being attached throughout the length of the tube of the corolla as in all other species of the genus, are attached only at the very base, and are otherwise perfectly free within the tube.

It has been suggested that the English plant may be (1) a dimorphic sexual form, or (2) a monstrosity. I do not believe it to be the former, because it has only one form—not two forms, as would be the case in dimorphism. I do not believe it to be a monstrosity, because the plant is abundant on the downs throughout a considerable area, extending over three or fonr miles in length, and the characters of the many specimens observed throughout this area are constant. Nor can the plant be a hybrid, for the only species occurring on the same ground are *E. Centaurium* and *E. pulchella*, neither of which exhibit characters which approach those which I have described as peculiar to our plant.

SHORT NOTES.

Osmunda regalis, *L.*, in Cambridgeshire.—In reference to the note by Mr. Pryor (Journ. Bot. 1881, p. 54), I may remark that the only authorities for it being found in the county are Dent's 'Appendix ad Cat. Pl. circa Cantagrigiam' (1685) and the remark by Mr. William Vernon in Ray 'Syn.' ed. 2 (1696). The locality is given by Dent as "within Gamlingay Park, and without by the pales in the corner next Sandy." Prof. John Martyn ('Methodus Pl.' 8) includes it on the same authority and in the same words. Prof. Thomas Martyn includes it ('Pl. Cantabr.' 23) with a note of inquiry, and does not notice it at all in his list of special localities of plants near Gamlingay. Relhan never saw it, although he was well acquainted with the place, being often at Gamlingay. Dent's 'Appendix' to the 'Catalogus' was printed long after Ray had finally left Cambridge and settled in Essex. I cannot find any other notice of this locality for the plant, which seems to have been destroyed soon after the time of Mr. Vernon (1690—96), who appears to have seen it, as he gives it as a guide to the *Fungus fontanus purpureus elegans*. Mr. Vernon was a Fellow of Peterhouse at that time, and the record of this fern rests wholly upon him and Dent. The Park has been long since divided into fields, and the "pales" removed; but otherwise the ground was not much altered until recently. I have examined all the possible places frequently, and so did the late Prof. Henslow, who marks it as to be omitted in the second edition of his 'Catalogue.' Perhaps I have not given sufficient credit to Dent and Vernon by supposing that they made a mistake. But I do not know what was to extirpate the plant between Vernon and Relhan's time, as ferns were not then systematically transplanted as is now unfortunately the case.—C. C. Babington.

THE AUTHORSHIP OF THE THIRD EDITION OF 'ENGLISH BOTANY.'—We have been requested to publish the following correspondence:—

"Thames Ditton, Jan. 28, 1881.

"Dear Mr. NEWBOULD,—Are you aware that a report has been spread among botanists to the effect that *you* are almost as truly the author of 'English Botany,' ed. 3, as is Dr. Boswell himself, whose name it bears as actual Editor? I first heard the rumour, several years ago, from a well-known botanical gossip; and it has been repeated to me subsequently by various persons up to the present time. I feel confident that such an absurd report cannot have originated with yourself, nor in any way can have been sanctioned or encouraged by you. But doubtless there may be many botanists who are less favourably placed for forming a correct judgment in the matter. And even a foolish allegation may become converted into an accepted tradition afterwards through obtaining a presently uncontradicted currency.

"Dr. Boswell handsomely acknowledged useful assistance given to him by yourself, in making references and tracing out various other details. But surely you and I shall both concur in holding it to be a special characteristic of 'English Botany,' in its third edition, that it is essentially and entirely the work of one mind, from beginning to end, in its purely scientific and descriptive portion. It digests into one comprehensive whole, re-written and re-tested afresh, the variously and utterly disconnected descriptions of the original edition.

"May I use the freedom of urging you to take some step towards contradiction of the false rumour? To my judgment this appears to be called for, not only as a matter of justice towards Dr. Boswell, but also in support of your own reputation for truth and conscientious dealing.—I am, yours very truly,

"The Rev. W. W. NEWBOULD, Kew." HEWETT C. WATSON.

"Montague House, Kew, Jan. 31st, 1881.

"Dear Mr. WATSON,—I have only received your letter in time to answer it now. I am much obliged to you for calling my attention to the vitality of a ridiculously absurd rumour, which I thought had been killed years ago.

"Every one who knows what I am, and what the great merits of Dr. Boswell's 'English Botany' are, must be sure I am as little capable of writing a book like that as the frog is of enlarging itself to the size of the ox. Dr. Boswell has always done me more than justice, and any one who says the contrary must be very ignorant or very wicked.

"As I do not know where this rumour exists, I put this letter at your disposal, and am, sincerely yours,

"H. C. WATSON, Esq., Thames Ditton." W. W. NEWBOULD.

Campanula rotundifolia, *L.*, in Japan. — In a small set of Japanese plants, kindly presented to me by Mr. J. Bisset, I was glad to find very good specimens of our common Harebell, *Campanula rotundifolia*, Linn., gathered by him at Oyama, in the island of Nippon, in Oct., 1876, and again, in the same locality, in Oct., 1878, growing on the humid face of a perpendicular rock, in company with *Saxifraga cortusifolia*, S. & Z., and *Conandron ramondioides*, S. & Z. Specimens sent by him to Kew were by some oversight returned as referable to *Adenophora verticillata*, Fisch. They are, however, in all respects identical with the typical form of the species. I think its occurrence in Japan worth recording, as neither Siebold and Zuccarini, Miquel, von Herder, nor Franchet and Savatier mention it as a native. Von Herder has given* a very full statement of the distribution of this plant, including many forms regarded by a large majority of students of the European flora as specifically distinct, and some of which at least it requires a strongly developed *doctrinaire* synthetic bias to refuse to acknowledge. Amongst Mr. Bisset's plants I also found *C. circæoides*, Fr. Schmidt,† which is apparently by no means rare in Japan, perfectly agreeing with original named specimens of Schmidt's from Sachalin. I mention it because neither he, as its discoverer, nor any subsequent writer on the Japanese flora, to my knowledge, has alluded to its affinities. I think, however, there can be no doubt that its nearest ally as yet known is the Cilician and Syrian *C. cymbalaria*, Sibth. & Sm., which, curiously enough, Boissier places next *C. rotundifolia*, Sm.‡ The last mentioned author's redistribution of *Campanulæ*, involving the suppression of A. De Candolle's two primary sections *Medium* and *Fucodon*, seems to me a distinctly retrograde step.—Henry F. Hance.

Ornithogalum tenuifolium, *Guss.*, in Portugal.—I am indebted to my friend, the Rev. J. H. Thompson, incumbent of Cradley, near Birmingham, for a set of a very interesting series of plants collected by him in Spain and Portugal in the spring of last year. Among them is an *Ornithogalum*, which I at once referred to *O. tenuifolium* of Gussone (*O. Gussonii*, Tenore), a plant which ranges on the northern side of the Mediterranean from Greece to Provence, on the southern side from Egypt to Marocco, and is found also in Corsica, Sicily, and other Mediterranean islands. Strange to say it has not hitherto been recorded from the Spanish peninsula, and appears only in Willkomm and Lange's 'Prodromus Floræ Hispanicæ' under the head of "Species inquirendæ," vol. i,, p. 217. Mr. Thompson's specimens were gathered on the 7th of April, 1880, at Cascaes, on the coast, west of Lisbon. Mr. J. G. Baker, of Kew, has kindly examined them, and agrees in the determination of the species. I have also to thank him for pointing out

---

* Act. hort. Petrop. I. 300.

† Reis. in Amur-lande u. a. d. ins. Sachalin, 154, t. 3. ff. 14—19.

‡ Fl. orient. iii., 919.

their identity with a specimen in the Kew Herbarium, received in December, 1876, from Professor Henriquez, and numbered 142. This specimen was gathered at Coimbra, and was distributed by the Professor under the name of *O. umbellatum*, but is assigned by Mr. Baker without doubt to *O. tenuifolium*, Gussone.—William Mathews.

On the Distribution in the Alps of Alchemilla conjuncta, *Bab.*—The occurrence in the Alps of *Alchemilla conjuncta*, Bab., a fact which has been familiar to me for upwards of twenty years, having recently been mentioned as a novelty, it is desirable to place upon record what is actually known of the distribution on the Continent of this form of *Alchemilla*. For the purpose of avoiding error I have submitted to Prof. Babington all the specimens in my foreign herbarium of the two allied species. He is of opinion that the plants from the undermentioned localities belong unquestionably to *Alchemilla conjuncta* :—1. September 7th, 1856; road between Dauphin and Bourg d'Oisans, Dauphiné (Haute Isère). 2. August 15th, 1860; La Bérarde Dauphiné (Haute Isère). 3. August 22nd, 1860; Val Pellice, Western Piedmont. 4. July 31st, 1874. Ormond dessus, Canton Vaud, Switzerland. Professor Babington further informs me that in the year 1878 he received from the Rev. Augustin Ley garden-grown specimens of *Alchemilla conjuncta* from a plant obtained near the Tosa Falls, in the Val Formazza, Piedmont. In the 'Cybele Britannica' (vol. i., p. 363, 1847), Mr. Watson states that this species had been gathered in Switzerland by Mr. Twining, and that specimens from Gouan, supposed to have been collected in the Pyrenees, are in the herbarium of the late Sir W. Hooker. The history and description of *Alchemilla conjuncta* will be found in Prof. Babington's paper in the 'Annals and Magazine of Natural History,' 1842, vol. x., p. 24. It has been treated as a distinct species by Mr. H. C. Watson in the 'Cybele Britannica,' and by Mr. Boswell Syme, 'English Botany,' vol. iii., p. 139. Sir Joseph Hooker regards it as a mere variety of *Alchemilla alpina*, L. (See 'Students' Flora,' 2nd edition, p. 123.) Nyman admits it as a species in his 'Sylloge Floræ Europææ,' 1854, p. 276, and in the 'Conspectus,' 1878, p. 238, with the localities Scotland and Faroe. So far as I know, it is ignored by every other foreign botanist, although it is certainly to be found in France, Switzerland. and Italy, and is probably widely distributed in Europe.—William Mathews.

Oxfordshire Roses. — In a hedge on the chalk-downs near Goring, Oxon, I noticed a Rose which has proved to be *Rosa aspernata*, Déség., an interesting record, since it extends very considerably its northern range. On the marly district of Stonesfield, between Woodstock and Charlbury, occurred a fine bush of *Rosa Kosinciana*, Besser. Mr. Baker has seen specimens of each.—G. C. Druce.

Notices of Books and Memoirs.

The Characeæ of America. By T. F. Allen, A.M., M.D. Parts 1, 2. S. E. Cassino, Boston, U.S.

Characeæ Americanæ Exsiccatæ: Distributæ a T. F. Allen, M.D. Pars I., nos. 1–10.

We have here the beginning of an important work, each part containing three large quarto coloured plates, with descriptions; and as it is apparently intended to figure every variety, the whole will probably contain some fifty or sixty plates. The descriptions are carefully drawn up, and many interesting remarks are added from the author's observations and from the works of A. Braun. Dr. Allen considers that *Chara sejuncta* should be included in Braun's aggregate species *C. gymnopus*, its only definite distinction being that the globules and nucules are developed separately at different nodes of the same branchlet. In support of the view that this character is insufficient, we might cite an instance of a specimen of *C. fragifera* in which the same state of things occurred, although *C. fragifera* is normally dicœcious. It may be here remarked that the name of *C. gymnopus*, in an aggregate sense, is inadmissible, as Prof. Braun's original *C. gymnopus* is an African segregate, although he subsequently used the name to include a number of his previous species. With regard to the plates, it is much to be regretted that the usefulness of the work has been so much impaired by their being coarsely and inaccurately executed, and they are not improved by the colours in which they are printed.

Under the second title, we have received the first part of what promises to be a most interesting addition to the published specimens of *Characeæ*. It contains nos. 1–10, among which are two new species—*Nitella intermedia*, Nordstedt, which is allied to *N. gracilis*; and *N. megacarpa*, Allen, a very striking plant of the polyglochin group. The specimens are very well prepared, and the *Nitellæ* especially reflect great credit on Dr. Allen for the care he has bestowed upon them. H. & J. G.

Two important contributions to our knowledge of Australian botany—Baron von Mueller's 'Eucalyptographia' and Mr. R. D. Fitzgerald's 'Australian Orchids'—progress with satisfactory regularity, the seventh part of the one and the sixth of the other having been lately issued. Baron von Mueller's careful plates and exhaustive descriptions, comprising much matter of economic importance, leave nothing to be desired, and Mr. Fitzgerald continues to report his observations upon the fertilisation of the plants which he figures, thus giving to his memoir a special value; he describes at some length, in the part now before us, the fertilisation of *Caleana*. We have also received a handy list of Tasmanian plants, entitled 'Census of the Plants of Tasmania instituted in

1879,' by Baron von Mueller; and a very useful list of Australian Algæ by Dr. Sonder, in which the Australian distribution of each species is briefly indicated; this last forms a supplement to vol. xi. of the 'Fragmenta.'

Under the title 'Illustrations of British Fungi,' Dr. M. C. Cooke has commenced the issue of a series of octavo coloured plates, "to serve as an atlas to the 'Handbook of British Fungi.'" The first number contains twenty plates illustrating the genus *Agaricus*.

New Books.—A. Le Jolis, 'Liste des Algues Marines de Cherbourg' (Paris, Baillière).—N. L. Marchand, 'Botanique Cryptogamique Pharmaco-médicale' (fasc. i.), (Paris, Doin).—P. van Tieghem, 'Traité de Botanique' (fasc. i.), (Paris, Savy).—Sereno Watson, 'Botany of California,' vol. ii. (Cambridge, Mass.)

Articles in Journals.

January.

Ann. Sciences Nat. (Botanique), ser. vi., tom. x., no. 4.—A. Pauchon, 'Researches on the *rôle* of light in germination' (concluded, 16*s*.)—E. Bescherelle, 'Bryological Flora of Reunion' (part 2).

Bot. Zeitung.—A. de Bary, 'On the classification of Thallophytes.'—R. Cario, 'Anatomical Researches on *Tristicha hypnoides*.'

Bull. Soc. Bot. de Belgique (vol. xix., pt. 2).—H. Pittier, 'On the distribution in the Swiss Alps of *Gentiana lutea*, *G. purpurea*, and *G. punctata*.'—F. Crepin, 'Notes paléophytographiques' (*Sphenophyllum myriophyllum*, *Sphenopteris Sauveurii*, spp. nov.)—T. Durand, 'Additions to the Flora of Liège.'—E. Marchal, 'Notes on *Hederaceæ* collected by E. André in N. Grenada,' &c.'

Brebissonia (Dec. 31).—P. Miquel, 'Researches on the Organisms of the Air' (concluded).

(*Coulter's*) *Botanical Gazette*.—E. L. Greene, 'New Species from Mexico' (*Delphinium scaposum*, *Draba mogollonica*, *Ribes pinetorum*, *Lithospermum cobrense*, *L. viride*).—J. Schneck, 'Cross-fertilisation of the Chesnut.'—M. E. Banning, 'New Maryland Fungi' (*Agaricus* (*Trichotoma*) *cellaris*, *A.* (*T.*) *Brownei*, *Russula cinnamomea*, *R. variata*).—W. K. Higley, 'Carnivorous Plants.'

Flora.—W. Nylander, 'Addenda ad Lichenographiam europæam.'—C. Dehnecke, 'On the motion of the protoplasm of the plant-cell.'

Hedwigia.—R. Wollny, 'The Marine Algæ of Heligoland.'

Magyar Nov. Lapok.—'Centenary of Chamisso.'—J. Schaarschmidt, 'On the division of *Closterium intermedium*.'

Naturalist (Huddersfield).—C. P. Hobkirk, 'How to examine a Moss.'

(*Esterr. Bot. Zeitschrift.*—'J. S. Poetsch' (portrait).—J. C. Schlosser, '*Senecio Vukotinovici*, n. sp.'—M. Seeland, 'On a trunk from the Pasterzen glacier.'—M. Gandoger, 'Pugillus Plantarum novarum' (contd.; forms of *Woodsia rufidula* and *Potamogeton trichoides*).—C. Marchesetti, 'An Excursion to Aden.'—P. G. Strobl, 'Flora of Etna' (continued).—J. Murr, 'On the Flora of North Tyrol.'—A. Oberuy, 'Vegetation of Thaia' (Iglau; contd.)

Science-Gossip.—G. Massee, 'Notes on some of our smaller Fungi' (concluded).

Scottish Naturalist.—J. Cameron, 'Gaelic Names of Plants' (continued).—J. Stevenson, 'Supplement to "Mycologia Scotica."'—F. B. White, 'Fungi of Perthshire.'—Id., 'On *Pseudathyrium flexile* and its relation to *P. alpestre*.'

Proceedings of Societies.

Linnean Society of London.

February 3*rd*, 1881.—R. M'Lachlan, Esq., F.R.S., in the chair.—Lieut.-Col. A. A. Davidson was elected a Fellow.—A note was read from Mr. A. Craig-Christie on the occurrence of stipules in the natural order *Ilicineæ*. In several books it is stated this order has exstipulate leaves, but specimens of *Ilex Aquifolium* were shown in which what appeared to be small deciduous stipules were present. Mr. Christie also called attention to the extreme scarcity of holly berries this season in the Lothians generally.—The following paper by Mr. George Bentham was read:—'Notes on *Cyperaceæ;* with special reference to Lestiboudois's Essai on Beauvois' Genera.' The author states Lestiboudois's Essai was founded on Palisot and Beauvois' manuscript, which was originally intended to follow his 'Agrostographia,' and has been almost entirely lost, and random guesses have been made at the species intended by the short characters given in Roemer and Schultes' 'Systema.' Nees von Esenbeck, in the 7th, 8th, and 10th volumes of the 'Linnæa,' and Kunth, in vol. ii. of his excellent 'Enumeratio,' appear to have correctly identified many of these. Eighteen so-called genera are here referred to various established genera. Steudel's 'Synopsis' is marked by the author's haziness of species. Boeckeler has a thorough knowledge of species, but his diagnoses are often excessively long. Mr. Bentham proposes few changes in the order of genera as set forth by Kunth, and he considers that Boeckeler's primary division of the order, as to whether the fertile flower is hermaphrodite or female only, bears the test of detailed examination.

Hermaphrodite flowers.	*Unisexual flowers.*
1. Scirpeæ.	1. Cryptangeæ.
2. Hypolytreæ.	2. Sclerieæ.
3. Rhynchosporeæ.	3. Cariceæ.

Then followed a short paper under the heading of 'Remarks on the Coffee Leaf Disease,' by Mr. Wm. Bidie, in a letter addressed to and communicated by Mr. J. Cameron, of Bungalore. The Coorg country referred to is situated in the Western Ghats, and the European enterprise in coffee has here wholly developed there within the last twenty-five years, and no disease was observed till four or five years ago. The author mentions that the disease appears to have been imported from Ceylon or by way of Chickmagloon, a district of Mysore, sixty miles distant from Coorg. It seems worst in impoverished exposed fields, and least where there is shade and rich soil. A small red insect has been noticed feeding over leaves covered with the pest, but its relation to the disease as yet remains undetermined. Plants grown from Ceylon seed suffer most, while those trees of Coorg origin and growth are least affected. A system of "renovation pitting" has been successfully tried, a pit being dug at short intervals, wherein, by pruning, are buried all the affected leaves; and this seems to check the spread of the disease, particularly among the Coorg coffee trees.—Dr. M. C. Cooke afterwards read a paper 'On the Coffee Disease in South America,' describing and summarising all the data extant, and showing that up to the present time coffee plantations in Venezuela, Costa Rica, Bogota, Caraccas, and Jamaica have been affected.

February 17*th*.—Frank Crisp, Esq., LL.B., F.L.S., in the chair.—Mr. W. Wickham exhibited and made remarks on two collections of plants from the Arctic regions. Of the fifty-seven species of flowering plants collected by Captain H. A. Markham in Novaya Zemlya in 1879, thirty-seven of the most interesting of these were placed before the Fellows of the Society for inspection. The absence of any species of Gentian is remarkable, as it is so characteristic of the European high lands, and, moreover, as Arctic Russia, to which Novaya Zemlya is in proximity, and from which it most probably derived its plants, contains six species of Gentian. Another interesting feature of the collection is the presence of three species of the *Leguminosæ*, found in abundance and of vigorous growth, viz., *Astralagus alpinus*, *A. frigidus*, and *Oxytropis campestris*. The family is unrepresented in Spitzbergen and Arctic Greenland. Of *Polemonium cæruleum* and its very arctic variety or subspecies *P. humile* (as noted by Sir J. Hooker in his notes to Captain Markham's voyage, 'Polar Reconnaissance'), Mr. Wickham remarks, whence came the variety? did causes forming the variety operate only in part, or were there two sources whence Novaya Zemlya was stocked? The second collection of typically Polar plants exhibited were those from the coast of Franz Josef-land, obtained by Mr. Grant, who accompanied Mr. Leigh Smith in his successful voyage thither in 1880. Some sixty-one species of flowering plants were collected, but from the account given of the country visited it is very probable a more ample flora yet awaits investigation.—Mr. C. B. Clarke read a paper on 'Right-hand and Left-hand Contortion of the Corolla.' He maintains that Linnæus's definition of right-hand contortion is correct, and

that the criticisms on it published by M. Alphonse DeCandolle in his 'Phytographie' are founded on a misconception. He holds that everybody understands the same direction (viz., the watch-hand direction), by the term right-hand contortion; that the apparent direction of rotation of the heavenly bodies appears reversed if the spectator looks north instead of south; that the direction of rotation is the same whether the observer supposes himself within or without the helix; but that the apparent direction of contortion of a helix is altered if the spectator reverses the direction in which he looks along its axis.

Botanical News.

We understand that the printing of Mr. B. D. Jackson's 'Guide to the Literature of Botany' is completed, with the exception of the Index, and the whole of that is now in the printer's hands; the work is expected to be ready for issue towards the end of this month. The total number of additions to Pritzel's 'Thesaurus' is stated to be 5840.

The Report of the English Dialect Society for 1880 announces that the third and concluding part of Britten and Holland's 'Dictionary of English Plant-names' will be issued during the present year; and that the reprint of Turner's 'Names of Herbes' is already in type, and will be issued as soon as Mr. Britten has completed his notes upon it. Mr. Britten has also in preparation a work upon 'The Folk-lore of British Plants.'

It is with very great regret that we announce the death of Mr. Reginald A. Pryor, which took place at Baldock on the 18th of last month.

Frau Johanna Lüders, *née* De Boor, died at Baden on 18th July last. She was born 21st October, 1811, married in 1831, and settled at Kiel in 1851, from which time she zealously studied botany under Nolte and others. Besides contributing to Rabenhorst's 'Decades,' several articles from her pen appeared in the 'Botanische Zeitung' and Max Schulz's 'Archiv.' Her collections and books are bequeathed to the Botanical Institute of Kiel University.

Prof. Alphonso Wood, of New York, author of 'A Class-Book of Botany,' 'Fourteen Weeks in Botany,' and 'The American Botanist and Florist,' died on January 4th of this year.

The death is announced of Dr. John J. Bigsby, F.R.S., on 10th February of this year, aged 88. He was the author of 'The Flora and Fauna of the Siberian Period,' 'Flora and Fauna of the Devonian and Carboniferous Formations,' and other palæontological works.

Tab 918

Original Articles.

A NEW VARIETY OF *CAREX PILULIFERA*, L.

By Henry N. Ridley, B.A., F.L.S.

(Tab. 218).

Through the kindness of Mr. F. Arnold Lees, specimens of a new British *Carex*, recently collected by him in Yorkshire, have been added to the British Museum Herbarium, and have been placed in my hands for description. The plant was obtained at Plumpton, near Knaresborough, Mid-west Yorkshire, in the month of July, 1880, and called by Mr. Lees, in a notice of it in 'Science Gossip' for December last and reproduced at p. 24 of this Journal, *Carex Saxumbra*. He says, in a letter accompanying the specimens, "You will observe its affinity with *C. pilulifera*, of which I regard it as a striking variety rather than a species. Mr. Watson and Mr. Baker coincided, however, in the opinion that it was worth naming. . . . . It grew in very large tufts, in deep shade, from the crevices and on the overhanging escarpments of red grit rocks, overhung and overgrown with the Scotch fir, wych elm, and oak trees. The leaves are narrow, deep bright green, with reddish brown sheaths at base, long fibrous roots, and long leafy bracts." The plant is undoubtedly a variety of *Carex pilulifera*, as Mr. Lees has suggested, and it is a sufficiently distinct variety to be worth attention.

The largest of the specimens received measures nineteen inches in height, and the leaves are proportionately longer, but narrower than in most specimens of *pilulifera*. The lower bract is remarkably long and curved, extending far beyond the terminal spikelet, and ending in a long fine point; in the largest specimen it measures two inches and a half in length; the upper bracts are also unusually long and slender. The male spikelet is shorter and darker in colour than in the normal variety. The nut differs from that of typical *pilulifera* in its longer beak, larger size, and longer, almost fusiform shape; the down with which it is covered is also shorter and scantier. The glume is red, with a dorsal green projecting vein, which terminates in a point rather more than one-third of the glume in length, and adorned with a double row of sharp processes which are continued down the vein, becoming fewer towards the base, and also along the upper margin of the glume. In the typical form of *pilulifera* the point is much shorter, and the whole glume is of a lighter colour.

The most striking differences between this plant and the normal form are those of the vegetative organs, and this seems to be to some extent at least correlated with the locality in which this plant

occurs, which is, as I have stated above, in the crevices of red sandstone rocks in deep shade, whereas *Carex pilulifera* usually grows in open heathy spots. There is a specimen in the herbarium of the British Museum which resembles this plant somewhat in the length of the lower bracts; it was collected by R. J. Shuttleworth "In locis lucidis sylvæ Bremgarten prope Bern." This is the nearest approach that I have seen to the Yorkshire plant. I propose to name it *Carex pilulifera*, var. *Leesii*.

EXPLANATION OF PLATE 218.—*Carex pilulifera*, L., var. *Leesii*. 1, fruit (enlarged); 2, fruit of *C. pilulifera* (enlarged).

THE MORPHOLOGY OF THE LEAF OF *FISSIDENS*.

BY RICHARD SPRUCE.

The leaves of Fissidens *were originally* 3*-lobed; with the medial and longer lobe, by a half-turn on its axis, placed vertically,* i. e., *at right angles to the other two lobes and to the base of the leaf, which is inserted transversely on the stem. As we now usually see them, the lobes have become connate; the two lateral lobes complicate into an equitant sheath, and at the keel, but especially at the apex, winged with the vertical medial lobe; but are still occasionally found more or less dissevered, as in the ancestral type.*

In a male flower of *Fissidens pusillus*, Wils., I have found the innermost involucral leaf, or bract, oblongo-rotund, not complicate but concave, cloven at the apex into three subequal short obtuse lobes; the middle lobe twisted half round so as to set it at right angles to the rest of the leaf, and traversed by a faint nerve, which was not continued downward into the integral portion of the leaf. By searching I found other male flowers with similar 3-lobed leaves, and a more or less rudimentary nerve, rarely extending to the base of the leaf. See also 'Bryol. Europ.,' fasc. 17, *Fissidens bryoides*, Hedw., t. 2, f. 10, and Sullivant's 'Icones Muscorum,' *F. obtusifolius*, Wils., t. 22, f. 20, where male bracts, more or less distinctly 3-lobed, are figured.

In the synoicous flower of "*F. pusillus*," Sch. Syn. ed. ii. = *F. viridulus*, Sw., var. *synoicus*, one or both of the bracts is not unfrequently seen 3-lobed. I found one instance of the innermost bract being merely canaliculate (not complicate), cloven just above the middle into two lanceolate patent lobes; the nerve (proceeding from the base of the leaf) forked at midway, and one branch of the fork continued up each lobe to its apex. At the sinus was a minute tongue-shaped process, evidently the aborted medial lobe, or lamina, whose place had been usurped by, and shared between, the two lateral lobes.

These cases, and other parallel ones that might be cited, show conclusively that the leaf of *Fissidens* is really 3-lobed; in the primitive *Fissidens* cloven perhaps nearly or quite to the base, the lobes having subsequently become "connate" in the manner which

we now find normal to all the species, viz., with the two lateral lobes complicate into a navicular sheath, embracing the stem; the longer medial lobe adnate to their apices and keeled suture, and extended in the same plane as the folded sheath, but at right angles to the latter when flattened out. All this is independent of the presence or absence of a nerve, for the leaf of *F. hyalinus*, Wils., is nerveless, and yet its structure is essentially the same.

Usually the lateral lobes are connate with each other nearly or quite to the apex, into the form of a boat, to the keel of which is adnate the vertical lobe; in some leaves, however, one lateral lobe is free from the other, and connate with the vertical lobe, in the same plane, but often sinuate at the suture (which can be distinctly traced). This brings the leaf into close relationship with that of *Micropterygium*, among Hepaticæ, where the complicate leaf, with a wing at the keel, is formed by the union of two lobes, whereof the smaller lobe is connate with the larger, considerably within the margin of the latter, so that the salient portion forms a broad wing at the suture, or keel; but when closely examined the leaf is seen to consist of only two planes, and not of three, as in the normal leaf of *Fissidens*. See in Lindenberg and Gottsche's 'Species Hepaticarum,' the figures of *Micropterygium*, fasc. 11, t. 21; and in Hooker's 'Musci Exotici,' the figures of *Gottschea appendiculata*, t. 15, and of *G. Thouarsii*, t. 48, which have leaves formed on the same plan as those of *Micropterygium*.

It must be admitted that, in their normal state, lobed or deeply-cut leaves are rare in the true Mosses; yet we have examples of such in *Diphyscium*, *Buxbaumia*, and a few others; and in my *Tayloria laciniata* (from the Andes of Quito) the involucral leaves may almost be styled pinnatifid. But in examining mosses, abnormal adhesions and cleavages not unfrequently meet the eye. I have seen, for instance, in various species of *Callicostella*—a genus of Hookeriaceæ, abundant in Tropical America, whose leaves are traversed nearly throughout their length by two stout parallel nerves—an occasional bilobed leaf, with one of the nerves running up into each lobe;—a somewhat analogous case to that of the bilobed leaf of a *Fissidens* above described. The diligent observer will call to mind frequent cases of divergence from the ordinary structure of the organs of mosses. If he has kept notes or drawings of them they may prove a valuable mine of raw material for future refining and working up; for the teratology of mosses has hitherto been too little studied, and it offers a fine and almost unoccupied field of research to any young bryologist desirous of distinguishing himself.

A REVISION OF THE INDIAN SPECIES OF *LEEA*.

By C. B. Clarke, M.A., F.L.S.

The species of the genus *Leea* indigenous to British India are arranged by Prof. Lawson, in Sir J. D. Hooker's 'Flora of British India,' i., 664–668. My friend Sulpicius Kurz has subsequently, in the 'Journal of the Asiatick Society of Bengal,' 44, ii., 178–180, and in his 'Flora of British Burma,' i., 278–281, dealt with the genus in a very different manner. In naming up my own collection of Bengal *Leea* for distribution, I have been obliged to compare Lawson and Kurz. In the following notes I have for convenience included all the Indian species, but I feel little confidence in the limits of any except the Bengal ones, all of which I know well by sight, as I took rather a special interest in the genus.

Leea is known, when in flower, from *Vitis* by the prominent white and yellow staminal tube; when in fruit, by the larger number of cells (4–8) in each berry. It is also generally known by its upright habit and want of tendrils; but there are two Indian Vines, viz., *V. spectabilis*, Kurz, and *V. cordata*, Wall., which are upright, without stipules. In the fruits of *Leea* some of the carpels often are abortive, so that 1–3-seeded berries are common; but in most fruiting examples some 4–6-seeded berries occur.

As regards the characters that should be employed for specific diagnosis in this genus, I have no absolute reliance on those used by Lawson and Kurz, but have no better to propose. Lawson employs the pinnation of the leaves for primary divisions, and then places as the only species in his first simple-leaved section a plant (*Leea latifolia*, Wall.) that has pinnate leaves. Kurz relies much on the notching of the lobes of the staminal tube, which I find a very uncertain character in the well-known species; for instance, in *Leea crispa* the lobes of the staminal tube are usually distinctly notched, but I have well-developed expanded flowers in which they are narrowed upwards entire apiculate. I therefore fear that this character must be very cautiously trusted in the case of species only once or twice collected. Kurz has introduced into the character of his *Leea gigantea* the mark, "seeds tubercled-keeled, the edges tubercled-ribbed"; but the seeds of *all* the species known to me are so very similar that I have been unable to make any use of the seed for specific diagnosis. Griffith, in his 'Ic. Pl. Asiat.,' t. 645, fig. 3, gives a faithful representation of a seed of *Leea*; it has a T-shaped groove on the back, two grooves near together on the inner narrow face, and one shallow groove on each flank. The filaments are curved inwards, and the anthers inverted and packed within the staminal tube in the bud: the anthers thus remain in the expanded flower so long as wet; but directly the sun dries it the filaments straighten themselves, and the anthers are long-exserted. I know no species, nor have I seen a single plant, where the anthers remain packed within the staminal tube altogether. Wight and Arnott, however, state that the anthers are usually "syngenesious'; and Brandis (as well as Lawson) introduces the

character "anthers connected" or "anthers free" into the specific descriptions. Kurz has ignored this character, and, I doubt not, rightly; the "syngenesious" theory seems *à priori* improbable; while, if the mucilaginous flowers be pressed wet, the anthers appear connected in the herbarium.

The colour of the berry is an excellent character in the field, and, I believe, absolute, *i. e.*, none of the red-berried species has ever been known to produce a yellow berry; but all these berries wither to black *at last*. The berries of *Leea* are exceedingly acrid till the moment when they become perfectly ripe, when they are edible, and resemble in flavour small grapes.

The colour of the flowers has been used by Kurz as a discriminating mark of species, and it is, in my judgment, one of the best, most decisive, and most absolute in the genus; the petals in one set of species are a greenish white, in another set a fine red. I have never known a case in which one of the red-flowered species produced a greenish white flower, or *vice versâ*. The colour of the petals is so marked that it can be distinguished in the herbarium in fairly-prepared examples.

Series A. **Rubriflora.**—Petals red. (All with compound leaves; none arborescent; none with the close primary nerves of the Sect. *Pycnoneuræ*).

Sect. 1. EDGEWORTHIÆ. Leaves all 1-pinnate.

1. L. ALATA, Edgw. in Trans. Linn. Soc., XX. 36.—Glabrous or nearly so, leaves 1–pinnate, ripe berries red.

Laws. in Fl. Brit. Ind. i. 665; Brand. For. Fl. 102; *L. rubra*, Royle Ill. 145, not of Blume; *L. Staphylea*, Wall. List, 6824, E. partly, not of Roxb.

Sirmoor, *Wallich*; Gurwhal, *Falconer*; North-west India, *Royle*; Deyra Dhoon, *Edgeworth*; Sikkim Terai, *J. D. Hooker*; Sikkim Terai and Mudhopoor Jungles, alt. 0–500 feet, *C. B. Clarke*.

A shrub, 2–5 feet high, stiff not succulent. *Leaves* pinnate; none 2-pinnate in the herbarium tips of branches, nor do I recollect any 2-pinnate lower leaves. *Leaflets* in the upper leaves 5–9, 10 by $2\frac{1}{2}$ in., oblong, shortly acute, rounded or rhomboid, unequal at the base, sessile or very shortly petiolated, glabrous or minutely puberulous on the nerves beneath, not dotted; primary nerves 11 on each side the midrib, $\frac{1}{3}$ in. apart, so that there are 2–5 serratures of the margin for each primary nerve; secondary nerves numerous, subparallel, conspicuous. Main rachis of the leaf often grooved or subulate; stipules large, rounded, deciduous. *Peduncles* 3–8 in., stout. *Corymb* dense, reddish, minutely rusty, hardly pubescent; bracts and bracteoles none, even in the corymbs containing buds only. Lobes of the staminal tube ovate-oblong, emarginate. *Berries* $\frac{1}{4}$–$\frac{1}{3}$ in. diam., with 4–6 carpels.—Kurz says, in 'Journ. As. Soc. Beng.,' 44, ii. 180, that his *L. sanguinea* in 'Journ. As. Soc. Beng.,' 42. ii. 66, described with much more compound leaves and an orange berry, was *L. alata*, Edgw. I believe Kurz never saw *L. alata*.

2. L. TRIFOLIATA, Laws. in Fl. Brit. Ind. i. 666.—Leaves 1-pinnate, leaflets 3 or 5, of which the two lowest are much reduced, elliptic shortly acuminate, pubescent on the nerves beneath, peduncle short, corymb pubescent, bracts narrowly lanceolate-linear, subpersistent.

South-east Assam; Namroop, near the Patkoy Mts., *Griffith* (Herb. Propr. n. 1293); Bootan, *Booth;* Assam, *Masters*, *Jenkins;* Cachar, *Keenan;* Mishmee, *Griffith* (Herb. Propr. n. 1344; but from the number I suspect this plant was collected in the Patkoy ranges: the locality Mishmee has been freely added to Griffith's Patkoy collection by the hand of somebody in Europe who imagined that the Patkoy Mts. were in Mishmee.

"A shrub, 8 feet high" (*Griffith*). Upper 3 leaflets attain 5 by 3½ in., rhomboid at the base, nearly glabrous, denticulate; primary nerves on each side the midrib 12, some ½ in. apart; secondary nerves close, parallel, conspicuous; lowest 2 leaflets near the apex of the long subpersistent stipules, sometimes appearing as mere auricles to it, sometimes ¼ in. long, only yet petiolated, sometimes developed half as large as the 3 upper leaflets. *Peduncle* 1 in. *Corymb* small; bracts ¼ by one-twelfth in. *Berry* ¼ in diam.; 6–4-celled.—I am not sure of the affinity of this species, I am not even sure that the corolla is red; but, should the corolla turn out to be green, I cannot agree with Prof. Lawson that the species is "closely allied to *L. aspera*."

3. L. PUMILA, Kurz in Journ. As. Soc. 41, ii. 302; 44, ii. 179; For. Fl. i. 278.—Leaflets of the upper leaves 5, densely softly villous beneath when young, corymbs peduncled, villous, appearing as compound umbels. *L. sanguinea*, M'Lelland MS.

Prome, *M'Lelland;* Karen Country and Tonkyeghat, *Kurz.*

The examples of M'Lelland and Kurz are simple shoots 6–9 in. long, bearing each 2 or 3 young leaves upwards and 1 flowering peduncle: I therefore assume these to be hot weather flowering shoots coming up after the annual burn. The species is, from M'Lelland's calling it *L. sanguinea*, and from the appearance of the dried flowers, a red-corolla one, and is really allied to *L. rubra*, Blume, which M'Lelland would have probably considered *L. sanguinea*, Wall. The whole of these shoots are brown-woolly. Young *leaflets* 2 by 1 in., ovate-lanceolate, subsessile; primary veins 10–12 on each side the midrib, much divided before they reach the closely-toothed edge; stipules large, subpersistent. *Peduncle* 2½ in.; rays of the quasi-umbel 7, 1¼ in. each; bracts and bracteoles early disappearing. *Flowers* closely clustered, subsessile; corolla fulvous without, some time before expansion. *Berry* unknown.

Sect. 2. LÆTÆ. Leaves 2-pinnate, none (or rarely) 3-pinnate.

4. L. ACUMINATA, Wall. List, 6830.— Upper leaves bipinnate; leaflets acuminate-caudate, obscurely or crenately toothed, glabrous; corymbs minutely rusty-villous, not stout; ripe berries orange-yellow.—*L. Staphylea*, Wall. List, 5824, C.

Bengal Terai, alt. 0–2500 feet, from Sikkin to Upper Assam, and

from the base of the Garrow Hills to Muneypoor, *Wallich*, *H. f. & T.*, &c.; common and often collected.

A succulent, weak under-shrub, 2–3 feet high, with large flaccid leaves, and the whole corymb coralloid-red, growing in moist shade. Uppermost *leaves* nearly always bipinnate; rhachis round, not stout; uppermost leaflets oblong, lowest leaflets often ovate; petiolules often $\frac{1}{6}$–$\frac{1}{4}$ in. Terminal leaflet 7 by 2 in., rhomboid at the base, not dotted beneath; primary nerves on each side the midrib 10, $\frac{1}{3}$ in. apart; secondary nerves somewhat close, parallel, and prominent; leaflets usually obscurely toothed, with 1–3 teeth for each main nerve, sometimes with blunt distant crenatures; stipules early deciduous. *Corymb* sessile or peduncled; bracts and bracteoles none even in the corymbs containing buds only. Lobes of the staminal tube subquadrate, emarginate. *Berries* $\frac{1}{4}$–$\frac{1}{3}$ in. diam., with 4–6 carpels.—Lawson has placed this with *L. sambucina*, though Hook. f. had noted the *scarlet* pedicels and flowers. It can be generally separated in the herbarium by the rusty-pubescent inflorescence, the leaflets of thin texture and not sharply toothed, the much shorter flower buds, even *in sicco* evidently red. Fruiting examples, where the pubescence of the corymb is nearly lost, are more difficult to distinguish.—Kurz has communicated an Andaman example marked "*L. acuminata*, Wall."? but it is, I think, *L. sambucina*, Willd.; there is no note of the colour, but the young corymb is glabrescent, the leaflets sharply toothed.

5. L. LÆTA, Wall. List, 6831, et Ic. ined. in Herb. Kew.—Upper leaves bipinnate; leaflets large, acuminate, dotted beneath; corymb very stout, minutely rusty villous, on very stout short peduncles.—Kurz in Journ. As. Soc. 42, ii. 65; 44, ii. 179; For. Fl. i. 278. *L. sanguinea*, Wall. List, 6824, M., not of Kurz.

Rangoon and Prome, *Wallich*; Burma and Andamans, *fide Kurz*. Distrib. Java.—The Kew Herbarium specimens are marked "Bengal," only without name of collector, and were probably distributed from the Calcutta Botanic Garden.

This species is not known to me alive: it seems so near *L. acuminata* that I imagine Kurz included *L. acuminata* under his description of *L. læta*. However, the Bengal *L. acuminata* is a succulent plant, and never shows the thick peduncle, short corymb, and dotted leaves of *L. læta*.

6. L. COCCINEA, Planch. in Hort. Donat. 6.—Upper leaves bipinnate; leaflets oblong, lanceolate-caudate, glabrous; corymbs short-peduncled, glabrous; petals rose-red, staminal tube yellowish.—Bot. Mag. t. 5299; Kurz in Journ. As. Soc. 44, ii. 178, 179.

"Not uncommon in the savannahs and savannah forests of Pegu; rarely in the diluvial forests of Martaban," *Kurz*.

This species is inserted as Indian on the authority of Kurz: I have never collected it, nor can I find, in any of the British herbaria, an Indian example. The native country of *L. coccinea*, Planch., is altogether unknown; but I cannot distinguish the cultivated specimens from some of the African examples called *L. coccinea* by Bojer (Hort. Maurit. 61). *L. coccinea* much resembles

L. acuminata, Wall., but differs therefrom by its very glabrous corymb. From Kurz saying that the inflorescence of his species was "glabrous *or nearly so*," and from his expressing an opinion that *L. coccinea* might be only a weaker form of *L. læta*, I cannot get rid of a suspicion that Kurz by *L. coccinea* meant *L. acuminata*, Wall., the more especially as I know Kurz had in his possession a totally different species authoritatively (but wrongly) marked *L. acuminata*, Wall.

Sect. 3. Rubræ. Leaves often 3-pinnate.

7. L. rubra, Blume, Bijd., 197.—Upper leaves 2–3-pinnate; leaflets small, the primary nerves beneath sharply raised, crisped, and often minutely setulose; corymbs minutely rusty, puberulous, short-peduncled; ripe berries deep red.—Decne in Ann. Mus. d'Hist. Nat. iii. 445; Hassk. Pl. Jav. Rar. 453; Miq. Fl. Ind. Bat. i. pt. ii. 610; in Ann. Mus. Lugd. Bat. i. 96; Kurz in Journ. As. Soc. 44, ii. 180; For. Fl. i. 279.—*L. sanguinea*, Kurz in Journ. As. Soc. 42, ii. 66?

Dacca, plentiful; and throughout the Mudhopoor Jungle, *C. B. Clarke;* Pegu, *M'Lelland:* Tenasserim, *Helfer* (Kew Distrib. n. 1281); Attaran, *Brandis* fide Kurz.—Distrib. Throughout Malaya to Borneo, and Cambodia.

The "scarlet dwarf," rarely more than 1–2 feet high, but spreading, stiff, and suffrutescent. Uppermost leaf often thrice-pinnate. Leaflets 2–3, rarely 4 in. long, oblong or elliptic, acute, hardly acuminate, sessile or scarcely petiolated, rhomboid or cuneate at the base, glabrous. Primary *nerves* (in a terminal leaflet 3 in. long) 11, much raised beneath in the dried example, but exceedingly thin and acute, crisped; the bristles on these nerves are a good specific character, but are very small and scarcely to be found in old leaves; crenations irregular, shallow, obtuse, often 2–3 for each main nerve; secondary nerves somewhat parallel, close, and conspicuous. Main rhachis of the leaf 4-winged; stipules large, more persistent than in most species. *Peduncle* 0–1½ in., stout, more or less 4-winged; corymb dense, often not longer than the petiole; bracts and bracteoles 0, even in the corymbs in bud. Lobes of the staminal tube notched. *Berries* ¼ in diam., with 4–5 carpels.—Kurz gives as the locality for his *L. sanguinea* "Ava," from which I infer that he never saw the plant alive, but had a specimen marked "*sanguinea*, Wall.," and collected either by Wallich or Griffith in Upper Burma. Kurz nevertheless describes the berry (which I assume he never saw except dry) as "orange coloured"; he may either have guessed this from the dried specimen, or there may have been a field-note by the collector. Kurz's description agrees so closely with the common East Bengal *L. rubra* that I should have assumed an error on Kurz's part, but that he knew *L. rubra* so well, in which the berry is always a deep red. Kurz's Ava plant is therefore either some species new to me or *L. rubra;* and Kurz is certainly mistaken in thinking it could have been either *L. alata*, Edgw., or *L. sanguinea*, Wall. At least, *L. sanguinea*, Wall., as to the type-specimen in Wallich's herbarium,

is identically *L. læta*, and the named specimen of *L. sanguinea*, issued to Kew from the Calcutta Botanic Garden, is *L. læta ;* but it is highly probable that Kurz has got a specimen of *L. rubra* collected and named by Wallich *L. sanguinea ;* for the name I have somehow got for *L. rubra* in my own herbarium is *L. sanguinea*, Wall., and I have issued it under that name both to Kurz and to others.

8. L. WIGHTII, C. B. Clarke.—Leaves 2–3-pinnate, glabrous ; leaflets elliptic-lanceolate, caudate, serrate, not setulose on the nerves beneath ; corymb sessile, divaricate, with long branches and branchlets, red rusty villous upwards : petals red.—*L. Staphylea*, Wight Ill. t. 58, not of Roxb. ; *L. robusta*, Wight in Herb. Propr., not of Roxb., nor of Wall., nor of Laws.

Deccan Peninsula ; Malabar and Courtallum, *Wight*, n. 523.

Referred by all authors to *L. sambucina*, which the leaves generally resemble, but have the secondary nerves very conspicuous. *L. sambucina*, as understood below, has green petals and a white-yellow staminal tube ; I have never known it produce petals *in the least* red, far less a red corolloid panicle ; nor have I ever seen *L. sambucina* with the upper panicle branches and pedicels villous. This may possibly be allied to *L. acuminata*, Wall., but the leaves are broader, more serrate, the corymb much wider.—Brandis and Dalzell both state that the flowers of *L. sambucina* are greenish white, and nevertheless quote Wight Ill. t, 58, for that species. Kurz, who has differentiated his species by the character of green and red petals, quotes Wight Ill. t. 58 under *L. sambucina* nevertheless. See further remarks under *L. sambucina*.

9. L. ACULEATA, Blume, Bijd., 137. — Glabrous ; stem and petioles prickly ; leaves 2–3-pinnate ; leaflets elliptic acuminate ; corymb short-peduncled.—Miq. Fl. Ind. Bat. i. pt. ii. 612 ; in Ann. Mus. Lugd. Bat. i. 99.

Nicobars ; Katchall, *Kurz* (in Journ. As. Soc. 45, ii. 124) ; and a Katchall example has been communicated to Kew from Leyden. —Distrib. Malaya and Borneo.

A shrub ; the prickles on the stem scattered, distant. *Leaflets* 5 by 2 in., the terminal one often cuneate at the base, the lateral rounded ; nerves 10 on each side the midrib, $\frac{1}{3}$ in. apart ; crenations usually few and somewhat deep ; petiolules (even of the upper leaflets) often $\frac{1}{4}$ in.—From the dried examples I guess the petals to have been red, and I suspect the fruits were red also. *L. horrida*, Teys. & Binn., the only other prickly species, has green petals. —Rumph. Herb. Amb. iv. t. 44, adduced for *L. aculeata* by Miquel, does not, I believe, represent either *L. aculeata* or *L. horrida ;* the aculeation of the stem is far too dense, but as Rumphius says the flowers were white, it was not *L. aculeata*.—The Katchall example has larger leaves than usual, but Borneo specimens closely resemble it.

10. L. SETULIGERA, C. B. Clarke.—Uppermost leaves 2–3-pinnate ; leaflets elliptic, acuminate, glabrous, very bristly on both

surfaces; peduncles slender; corymb small, dense, glabrous (corolla red?).

Concan, *Dr. Stocks*.

From the well-preserved examples of Dr. Stocks it is tolerably certain that the corolla is red; but, whatever the colour of the corolla, the example cannot be matched with any other *Leea* at Kew. The leaves and leaflets generally resemble those of *L. rubra*, but the margin is closely, regularly, acutely (not deeply) serrate; and between each pair of main nerves, on the upper surface of the leaflets, are 3–5 rows of unusually stiff bristles. *Peduncles* 1½ in.; bracts and bracteoles 0, even in the corymb in bud. *Flowers* as in *L. rubra*.

(To be continued).

NOTES ON SHROPSHIRE PLANTS.

By William E. Beckwith.

(Continued from p. 51.)

Ulex Gallii, Planch. On Grinshill Hill.

Genista anglica, L. Boggy field near Berrington; boggy ground near the High Vinealls, Ludlow.

G. tinctoria, L. Very frequent in fields under the Wrekin; near Cressage Park, Ironbridge, and the Bulthy Hill.

Ononis campestris, Koch. Rather rare. Near Dryton, Wroxeter; Shineton, Ironbridge, and Coalport.

O. arvensis, Fries. Much more frequent than the last species: very common near Little Wenlock, Buildwas, and Harley.

Anthyllis Vulneraria, L. On limestone rocks near Much Wenlock.

Medicago maculata, Sibth. About Eyton Rock, Wroxeter.

Melilotus officinalis, Willd. Fields near the Arkoll Hill, Wellington.

Trifolium arvense, L. Hermitage Hill, Bridgnorth; near Haughmond Abbey, and Snow Pool, Dryton.

Astragalus glycyphyllus, L. On the High Rock, near Bridgnorth.

Ornithopus perpusillus, L. Very abundant on the High Rock, Bridgnorth; found also near Church Stretton, Cound, Eyton-on-Severn, Grinshill, and Charlton Hill.

Vicia tetrasperma, Moench. Rather frequent about Eaton Constantine, Berrington, Wroxeter, Uffington, Bridgnorth, Leighton, and Harley.

V. sylvatica, L. Shelton Rough, near Shrewsbury; Jiggers Bank, near Coalbrookdale; near Buildwas Park, Ludlow, Stokesay, and Berwick.

Lathyrus sylvestris, L. Bank of the Severn near Eaton Constantine; near Evenwood Cound.

Prunus avium, L. Near Buildwas, Leighton, and in Attingham Park. There are some very fine trees of this species in the woods round Bomere Pool.

Spiræa Filipendula, L. In a small wood near Much Wenlock.

Poterium Sanguisorba, L. Frequent near Much Wenlock; near Whitemere Mere.

Alchemilla vulgaris, L. Not uncommon about the Wrekin: and near Buildwas, Belswardyne, Cound, Leighton, and Shineton.

Potentilla argentea, L. On and near Haughmond Abbey; near Dryton, Wroxeter.

P. Comarum, Nestl. Very frequent in bogs and by pools near Cound, and Berrington; by the side of Bomere Pool, and about all the Ellesmere Meres.

Rubus Idæus, L. Very frequent about Ellesmere and Whixall Moss; frequent in damp woods near the Wrekin.

Geum rivale, L. Brook near Craven Arms Station.

Rosa rubiginosa, L. Near Charlton Hill, Wroxeter.

Pyrus torminalis, Ehrh. A single tree near Cressage; several trees in a small wood at Shinewood, near Shineton; a large tree seven feet in circumference by the foot-road from Shineton to Lawley's Cross, Buildwas.

P. Aucuparia, Gærtn. Woods and hedges round the Wrekin, and about Ellesmere; frequent.

Lythrum Salicaria, L. Banks of the Severn and Tern; sides of pools about Leighton, and Buildwas, and by Whitemere Mere, near Ellesmere.

Peplis Portula, L. Very frequent in woods round the Wrekin, and near Bomere Pool.

Epilobium angustifolium, L. In several places in the woods round the base of the Wrekin, but scarcely ever in bloom; about Grinshill, Shawbury Heath, and Stokesay; abundant on Whixall Moss, where the variety *brachycarpum* is most frequent.

E. hirsutum, L. Sides of pools and ditches: very frequent.

E. montanum, L. Very frequent in woods on high ground.

E. roseum, Schreb. Ditches about Harley, and Shineton. A well-marked species differing considerably from *E. montanum* in the shape of the leaves.

E. tetragonum, L. Wet places round the base of the Wrekin; woods near Bomere Pool; near Cressage; and Downton Castle.

E. palustre, L. Pools about Ellesmere, Brompton, near Rerrington, Berwick, and Willey Hall; by the side of the Shropshire Union Canal, in many places.

Circæa Lutetiana, L. Frequent in moist wet woods; very abundant round the Wrekin.

Myriophyllum verticillatum, L. In ditches near Eyton-on-the Wealdmoors, Wellington.

M. spicatum, L. Pools and ditches; very frequent in the Shropshire Union Canal.

Bryonia dioica, L. Hedges; very frequent.

Ribes Grossularia, L. Hedges near Eaton Constantine and Leighton; very frequent about Whixall Moss and Ellesmere.

R. rubrum, L. Wet places in woods, and by streams; frequent in the neighbourhood of the Wrekin, and about Ellesmere.

R. nigrum, L. A few bushes in a wet wood at the south-west base of the Wrekin.

Sedum purpurascens, Koch. Frequent just on the borders of Shropshire near Middletown, and under Moel-y-golfa Hill: occurs also near Haughmond Abbey.

S. reflexum, L. Walls and rocks about Bridgnorth, Haughmond Hill, and Ludlow.

S. elegans, Lej. On the Longmynds, near Church Stretton. The variety *minus* of this species is the *S. Forsterianum* of Leighton's Flora.

Cotyledon Umbilicus, L. Very frequent about Bridgnorth, Church Stretton, Eyton-on-Severn, Bulthy Hill, Grinshill, and Hawkstone Park.

Saxifraga tridactylites, L. Old walls about Bridgnorth, Much Wenlock, and Acton Burnell.

S. granulata, L. Frequent on dry sandy banks near Wroxeter, Berrington, Leighton, and Attingham Hall; may be also found growing luxuriantly in *wet* meadows by the side of the Worfe near Rindleford, Bridgnorth.

Chrysosplenium oppositifolium, L. Very frequent; abundant by streams, and in wet places near the Wrekin, Cound, Shineton, Harley, and Buildwas.

C. alternifolium, L. By a small brook flowing from the Longwood to Brockholes Bank, Leighton.

Parnassia palustris, L. Wet field between Cound Moor and Acton Pigot; near Church Preen; near Croesmere Mere.

Astrantia major, L. On a hill near Stokesay, Ludlow.

Cicuta virosa, L. By Colemere and Whitemere Meres; Hencott Pool, near Shrewsbury; and a small pool at Norton, Wroxeter. In its fresh state this plant is certainly not injurious to cattle; at Norton they browse it off so closely that I can seldom obtain a specimen in flower; and at Colemere Mere I have also found it eaten off.

Helosciadium inundatum, Koch. Berrington and Bomere Pools; pools near Eaton Constantine, and Upton Magna.

Petroselinum satirum, Hoffm. Rocks about Bridgnorth, and Eyton-on-Severn.

Sium angustifolium, L. Frequent along the banks of the Shropshire Union Canal near Uffington, Upton Magna, and Withington; by Colemere Mere, and in ditches near Eyton-on-the-Wealdmoors.

Oenanthe fistulosa, L, Frequent about Berrington, Bomere, Eaton Constantine, and Ellesmere.

Oe. crocata, L. Frequent by the Severn and Tern, and near Buildwas, Leighton, and Ellesmere.

Oe. Phellandrium, Lam. Frequent about Berrington, Ellesmere, and Whixall Moss; I have also found it at Sundorne and Cressage.

Silaus pratensis, Besser. Fields near Longwood Eaton Constantine; near Leighton, and round Much Wenlock.

Pastinaca sativa, L. On the ruins of Uriconium at Wroxeter.

Chærophyllum Anthriscus, Lam. Near Bridgnorth, Cound, and Wroxeter.

Myrrhis odorata, Scop. Ruins called the "White Ladies" near Shifnal, and about Stokesay Castle.

Conium maculatum, L. Not unfrequent about Bridgnorth, Buildwas, Leighton, Shifnal, and Betton; common by Cound and Shineton brooks.

Smyrnium Olusatrum, L. About Ludlow Castle.

Cornus sanguinea, L. In woods and hedges; very common round the Wrekin.

Viscum album, L. Grows on the poplar near Pitchford, the hawthorn at Longner and Attingham, and the crab near Leighton. By no means common in North Shropshire.

Adoxa Moschatellina, L. Very frequent about the Wrekin, Ellesmere, and Berrington.

Sambucus Ebulus, L. Old lime quarries on Lincoln's Hill, Ironbridge.

S. nigra, L. A large bush of the variety *laciniata* grows on Charlton Hill, Wroxeter.

Viburnum Opulus, L. Very common in wet woods and bogs near the Wrekin.

Galium erectum, Huds. Frequent near Shifnal, especially about and Evelyth; occurs also on the banks of the Severn, below Coalport, and near Bridgnorth.

Asperula odorata, L. Very common round the Wrekin, and in woods round the Ellesmere Meres.

Valeriana dioica, L. Marshy places near Pitchford, Leighton, and Charlton Hill, frequent.

Dipsacus sylvestris, L. By the Severn and Tern in several places; very frequent round Much Wenlock, Ironbridge, and Buildwas.

D. pilosus, L. Very frequent about Cound; I have also found it in Farley Dingle; near Lumhole Pool, Coalbrookdale; Middletown; and Eyton-on-the-Wealdmoors.

Scabiosa Succisa, L. A variety with white flowers grows very frequently under the Wrekin and near Belswardyne Hall.

S. columbaria, L. In a larch plantation near Much Wenlock, and just on the borders of Shropshire, near Middletown.

Onopordum Acanthium, L. Fields near Norton and Eyton Wroxeter.

Carduus eriophorus, L. Left bank of the Severn, near Buildwas.

Carlina vulgaris, L. Frequent round the base of the Wrekin and on the Longmynds; occurs also on Shirlet Hill, Willey; Greenshill; Bausley Hill; and Stephen's Hill, Cound.

Centaurea Scabiosa, L. Very frequent about Much Wenlock; not uncommon near Cressage, Leighton, and Wroxeter.

C. Cyanus, L. Occurs every year in fields near Eaton Mascott and Bomere, and often in corn-fields in other places.

Chrysanthemum segetum, L. Frequent about Eaton Mascott, and on Shawbury Heath.

Achillea Ptarmica, L. Wet places, especially on high ground; very frequent round the base of the Wrekin.

Filago minima, Fries. High Rock, Bridgnorth; Mill Glen,

near Church Stretton; Tentree Hill, and on the Cambrian Railway over Whixall Moss.

Gnaphalium sylvaticum, L. Base of the Wrekin near Wenlock's Wood, High Vinealls, near Ludlow; hill near Stokesay, and on the High Rock, Bridgnorth.

Senecio sylvaticus, L. Very frequent about the Wrekin.

Bidens cernua, L. Very frequent about Ellesmere; by Sundorne pool, Acton Burnell pool, pools at Willey, Uckington, Oakley Park, and ditches on the Wealdmoors at Eyton.

B. tripartita, L. More frequent about Ellesmere than the last species; near Acton Pigott.

Inula Helenium, L. Near Langley; Acton Burnell; near Brompton, Berrington; by the brook at Harley and Shinewood; near Buildwas Railway Station.

I. Conyza, DC. Very common about the Arkoll Hill, Wellington; near Much Wenlock; and Stephen's Hill, Cound; frequent about Buildwas, Ludlow, Stokesay, and Middletown.

I. dysenterica, L. Very abundant in wet fields between the Wrekin and the Severn, and near Cressage Park.

Erigeron acris, L. Not unfrequent about Bridgnoth, Much and Little Wenlock, and Harley; very common on old walls in the town of Ludlow.

Solidago Virgaurea, L. Frequent about the Arkoll Hill, the Breidden Hills, Bridgnorth, and Wenlock's Wood near the Wrekin.

Petasites vulgaris, Desf. Abundant by Cound and Shineton Brooks; near Shifnal, and in Farley Dingle.

Cichorium Intybus. By the side of the Severn Valley Railway, between Shrewsbury and Berrington, and sometimes in the adjacent fields.

Picris hieracioides, L. Frequent about Buildwas, Coalport, and Much Wenlock; I have found specimens, too, near Eaton Constantine and Charlton Hill.

Tragopogon pratensis, L. Frequent about Ironbridge and Buildwas; I have collected it also near Eaton Constantine, Cound, Stokesay, and Leighton.

Lactuca muralis, Fres. Frequent on dry banks or walls, about Acton Pigott, Much Wenlock, Buildwas, Willey Hall, Shifnal, Coalport, Ludlow, and Church Stretton.

Hieracium murorum, Fries. I have collected specimens of this plant near Ludlow and Shifnal; I have also had specimens sent by Mr. R. M. Sergeantson from the Caradoc Hill.

H. vulgatum, Fries. Not unfrequent about the Wrekin.

H. umbellatum, Vill. Brought me by Mr. R. M. Sergeantson from near Acton Burnell. I have also found it on Shawbury Heath, and round the edge of Whixall Moss.

H. boreale, Fries. Very frequent on high ground, especially about the Wrekin.

Lobelia Dortmanna, L. Berrington Pool, Bomere Pool, Blackmere and Newton Meres, near Ellesmere.

Jasione montana, L. Frequent about Church Stretton, Grinshill, and the Breidden Hills; I have also found it near Eaton Constantine, Ellesmere, and Whixall.

Campanula Trachelium, L. Very frequent in hedges and open woods round the Wrekin, and in the parishes of Buildwas, Leighton, Eaton Constantine, and Wellington.

C. patula, L. Frequent about Berrington and Cound, especially near Cound Stank.

Vaccinium Oxycoccos, L. Shomere Moss, and boggy ground near Bomere Pool; Whixall, and Welshampton Mosses.

V. Vitis-idæa, L. Mr. W. Phillips sent me specimens of this plant, in 1877, from the Stiperstones Hill.

V. Myrtillus, L. Very abundant on the Longmynds; frequent in Willey Park, about the Wrekin, and near Ludlow.

Andromeda Polifolia, L. Rather frequent on Whixall and Welshampton Mosses.

Pyrola minor, L. In a rock-hole on Whitcliff, near Ludlow.

Ligustrum vulgare, L. Woods about Much Wenlock and Buildwas, apparently wild.

Vinca minor, L. Near Leighton; and Ruckley, Acton Burnell.

Erythræa Centaurium, Pers. Very frequent about Much and Little Wenlock, and round the base of the Wrekin; I have found it, too, near Eaton Constantine, Cressage, Cound, Uffington, and Ellesmere.

Chlora perfoliata, L. Frequent about Much and Little Wenlock, Broseley, and Ironbridge; it also occurs near Cressage Park, Church Preen, Whitchurch, and Ellesmere.

Gentiana Amarella, L. Frequent near Much Wenlock and Harley; I have also found it near the Wrekin and under the Arkoll Hill.

Menyanthes trifoliata, L. Pool near Eaton Constantine; frequent in Berrington and Bomere Pools; abundant in the Ellesmere Meres.

Polemonium cæruleum, L. On the banks of the Worfe, near Rindleford, Bridgnorth.

Convolvulus sepium, L. Very abundant on the banks of the Severn, near Buildwas and Ironbridge.

Cuscuta Epithymum, Murr. Naturalised on gorse on Charlton Hill and Tentree Hill, where it has lived for some years.

Solanum nigrum, L. Frequent near Cound.

Atropa Belladonna, L. Woods between Cound and Evenwood, in several places; on the slopes of the Wrekin near Cludley, and on Lawrence's Hill.

Hyoscyamus niger, L. About the old ruins at Wroxeter, twenty years ago it was plentiful, but now it has become rare.

Verbascum Thapsus, L. Frequent round the Wrekin, Arkoll, and Tentree Hill; found also about Charlton Hill, Eyton-on-Severn, Cound, and Ellesmere.

V. Lychnitis, L, Near Snow Pool, Dryton, Wroxeter.

V. Blattaria, L. Apparently quite wild near Leighton, Eyton-on-Severn, and Bettisfield.

Scrophularia aquatica, L. Banks of the Severn and Tern; near Eaton Constantine, Leighton, Buildwas, Shineton, Harley, and Cound.

S. Ehrharti, Stev. Frequent near Buildwas, Coalport, Shineton, and Cound, and on the banks of the Teme, near Ludlow.

S. nodosa, L. Frequent on the Wrekin and in the surrounding woods, growing in drier situations than the two last species.

(To be continued.)

A NEW HONGKONG *ANONACEA*.

By H. F. Hance, Ph.D., F.L.S., &c.

Nine years ago, in the Supplement to the 'Flora Hongkongensis,'* I recorded an Anonaceous plant, apparently referable to the genus *Melodorum*, but only known in fruit. Being very anxious, if possible, to determine this new plant satisfactorily, I asked Mr. Charles Ford, superintendent of the Hongkong Botanic Gardens, who takes much interest in the Flora of the island, to have the goodness to try and get flowering specimens, and in August, 1879, he told me that he had found it on Victoria Peak, whilst my original plant grows in the thick wood at Hongkong, where I first gathered fruiting specimens in August, 1861. On since comparing the two, I was surprised to find Mr. Ford's altogether different from my species; but, though not in fruit, it is certainly a *Melodorum*, and as it appears quite distinct from any enumerated in the 'Flora of British India,' or in Miquel's last review of the *Anonaceæ* of the Indian Archipelago,† I now describe it from very satisfactory materials, for which I have to thank Mr. Ford. It is, I beileve, nearest in affinity to *M. rufinerve*, H. f. & Th., and *M. Wallichii*, H. f. & Th. The flowers, soaked in boiling water for the purpose of dissection, and the dried leaves, broken up between the fingers, exhale an odour of nutmeg.

7907 Melodorum (*Eumelodorum*) glaucescens, sp.nov.—Late scandens, ramis cortice glabro nigricante ruguloso obtectis, ramulis rufulo-tomentellis, foliis anguste oblongis basi obtusis apice emarginatis supra glaberrimis opacis costa impressa venisque vix prominulis crebre reticulatis subtus glaucescentibus pilis brevibus adpressis oculo tantum armato conspicuis dense obtectis, costa valida rufo-tomentella costulisque parallelis 10–13 jugis elevatis venulisque transversis prominulis notatis 2½–6 poll. longis 8 lin. ad 1¾ poll. latis petiolo crasso tomentello lineali, inflorescentia rufo-sericea, floribus secus rachem innovationes terminantem fasciculatis, fasciculis distantibus alternis 5–8 floris simpliciter umbelliformibus vel cymulosis singulo folio florali fulto, sepalis triangulatis semilineam longis cum petalis exterioribus plano-convexis ovatis obtusiusculis 2½ lin. longis extus dense rufo-sericeis, petalis interioribus ovatis minute cinereo tomentosis inferne excavatis, ovariis rufo-tomentosis.

In summo monte Victoria Peak, ins. Hongkong, m. Augusto, 1879, coll. C. Ford. (Herb. propr. no. 21,141.)

---

* Journ. Linn. Soc., xiii., 99.

† Ann. Mus. Bot. Lugd.-Bat. ii., 1 sqq.

NEW BRITISH LICHENS.

By the Rev. W. Johnson.

I beg to record the following additions to our lichen-flora. I have submitted specimens to Dr. W. Nylander, who has determined and named them. As a strictly scientific description of these plants will be given by Dr. Nylander himself, in his forthcoming 'Addenda ad Lichenographiam Europiam,' I shall not attempt that here, but, pending those descriptions, simply give my own observations of the plants, with their discovery.

Lecanora rhagadiza, Nyl., *n. sp.*—The thallus of this lichen is indeterminate, of a medium thickness, rimoso- or somewhat areolato-diffract. When dry, the chinks are rather wide. The surface is slightly uneven, and of a dull virescent colour. It has a little the faded appearance of having been washed with water. The apothecia are innate and suburceolate, with an obtuse even margin; their colour is fuscescent, margin paler, The hypothecium is pale; paraphyses slender, filiform, conglutinate. While adherent the apices are fuscescent; when separated by K they are pale and slightly articulate. The asci are lineari-clavate. The spores numerous, colourless, oblong, very minute. The gelatina-hymenea is cærulescent, then slightly tawny with iodine. Thallus K— C—. This plant was found on fresh-water-washed sandstone, close beside the sea; Barrowmouth, near Whitehaven, Cumberland, 1880.

Lecanora albo-lutescens, Nyl., *n. sp.*—Thallus white or between white and grey; its growth seems to be from white at first to a bluish grey in age. It is closely adherent, indeterminate, leprose, or areolate. The areoleæ have a scabrous appearance. The apothecia are waxy, orange-red, concave, with thick proper margin, growing paler outward, until it blends with the subtending thalline margin. The centre of the apothecia is frequently, though not always, furnished with an umbo, and the margin often flexuose. The hypothecium is pale; paraphyses are moderate, free. The spores are eight, polari-bilocular, ellipsoid; the polar cells are large, with a distinct connecting tube. With K the hymenium becomes deep crimson, especially the apices of the paraphyses. Thallus K— C— apothecia K deep crimson. This lichen grows on sandstone rocks, in low altitudes, where the atmosphere is moist. I first gathered it on the rocks by the side of the River Tyne, at Bywell, Northumberland, in 1878. Since then I have found it at Wark-upon-the-Tyne, Northumberland; and on the roadside between Whitehaven and Scalegill, Cumberland.

Pertusaria spilomanthodes, Nyl., *n. sp.*—Thallus cinereous, thickish, rimoso diffract; margins of the widish chinks, when dry, irregular and tending upward. Surface of thallus much and deeply wrinkled, very uneven. Apothecia innate, rugoso-difformed; ostiola open, irregular, black; when wet, minutely granulate or papillose, with prominent thalline margin. Section of hymenium rather dark; paraphyses slender. Spores from two to four in each

ascus, large, ellipsoid, sometimes oviform, violet, with a yellowish tinge in the centre. When K is applied, distinctly and deeply violet. Epispore broad, transversely banded or wavy with light and shade. The central part of spore is rough and granular; with K it sometimes assumes a smooth and cellular appearance. Paraphyses, asci, and epispore are deep blue, with iodine. Thallus K yellow, then deep orange-red. This lichen is allied to *Pertusaria Urceolaria*, Nyl., but differs from it in the colour and non-isidiose condition of thallus, in the thickness of the paraphyses, and the number and character of the spores. It was found on granitic rocks beside Ennerdale Lake, Cumberland, 1880, and no doubt is a very rare plant.

I have also met with the following rare lichens, the occurrence of which in Cumberland it may be desirable to record:—

Lecanora erysibe, forma *obscurata*, Nyl.—On old walls, Asby, Cumberland, 1880.

Graphis elegans, forma *simplicior*, Cromb.—Thallus similar to type; lirellæ short, mostly simple, a few branched at right angles; thalline margin prominent when mature; epithecium rimæform more or less open, proper margin moderate, slightly flexuose, plain. Same habitat as the type. Woods near Asby, Cumberland, 1880.

BRYOLOGICAL NOTES.

By W. West.

The last edition to the British Moss-Flora is *Lescuræa mutabilis*, Brid. (*Pterigynandrum mutabile*, Brid., Bryol. Univ., is the earliest name; *Pterogonium striatum*, Schwg., and *Lescuræa striata*, B. & S. Bry. Eur., are also synonyms), which I gathered last August on mica-schistose rocks, near the summit of Ben Lawers, on the south-east side. It was growing near or with *Pseudoleskea atrovirens*, Dicks., as one of my envelopes contained both species. The plants gathered were female ones, and belong to the form which grows on trees, and not to the form (var. *saxicola*, Milde), which grows on rocks. The latter form is more robust, having broader and less acuminate leaves in the specimens I have examined. I have also had Norwegian and Pyrenean specimens of the form found on trees sent to me by the Rev. J. Fergusson, to whom I am also indebted for the var. *saxicola*, as well as for the correct determination of the Ben Lawers plant. I have compared them with the latter, and in general appearance they thoroughly agree, save that the Pyrenean specimens have their leaves only slightly subsecund, agreeing in this with the saxicolous form from Norway. The corticolous form gathered from a tree in Norway is exactly identical in its decidedly subsecund leaves with the corticolous form found on rocks on Ben Lawers. The specimens gathered from trees had almost entire leaves, while both the specimens from rocks had the leaves distinctly serrate in the upper part. Schimper says of the leaves of the corticolous form, "erecto patientia et patientia;" of the var. *saxicola* he says, "pro more subsecunda." My limited

examination of specimens (from only four localities) shows that both forms vary; therefore the subsecundity of the leaves cannot safely be used as a distinguishing character. This species belongs to the orthocarpous leiophyllous *Hypnaceæ*, and is the only European species of the genus.

Not far from the same place on Ben Lawers I gathered *Timmia austriaca*, Hedw.; this is an interesting find, for, as far as I am aware, it was only previously recorded in Britain from the banks of the Isla, in Forfarshire. I have just been examining about a score packets of *Timmiæ*, and I find in examples from different places that the depth of serration of the leaves varies, as does also their length, in both *T. megapolitana*, Hedw., and *T. austriaca*, Hedw. In the latter species the extent of the serration on the margin also varies considerably, not at all approaching the base in some specimens, notably so in a specimen from Cape Warrenden, Arctic Regions, in which the serration is confined almost entirely to the apex. In those specimens where the serration on the margin of the leaves descended the lowest, the serrulation on the back of the nerve was also continued lower down; this was especially the case with robust specimens from the Pyrenees, Viarelia, and South Tyrol. The distinctly sheathing orange base of *T. austriaca*, Hedw., is a good character, though in specimens of *T. megapolitana*, Hedw., from Canada, the characteristic shorter *white* sheathing base was distinctly lutescent approaching orange, but not by any means as deep in colour as it is in *T. austriaca*, Hedw. The serration is denser and generally coarser in *T. megapolitana*, Hedw., than it is in *T. austriaca*, Hedw. The var. *bavarica*, Hessler, of *T. megapolitana*, Hedw., is well described by the character "serration confined to upper part of leaf," and moist examples seem to have more spreading (almost recurved) leaves than the type. The leaves of *T. norvegica*, Zett., appear to be less pellucid than in the other species, and the papillosity of the upper part of the back of the nerve alone thoroughly distinguishes it from both the other species. (I think also that the two European species of *Buxbaumia* offer a distinctive character in the different degree of roughness of their setæ.) I find the character of "curvation of leaves when dry" of no use, only in *T. austriaca*, Hedw., they seem to have a homomallous tendency.

Schimper says that there is only another species of the genus which occurs in N. America. Is it Rau and Hervey's Catalogue, and if so, under what name, as this genus is not in their catalogue?

SHORT NOTES.

CHEMICAL TESTS FOR LICHENS.—Most lichenologists have probably found the solution of chlorinated lime to be a very unsatisfactory preparation, as it loses its properties after a time. To avoid mistakes likely to occur through this fact being unnoticed, I have found it advisable to previously test it on the sorediate form of *Pertusaria velata*, which is easily obtained, at least in the south

of England. If the chlorinated lime solution be in good condition this lichen will turn a brilliant carmine-red immediately the thallus is touched with the liquid. But it has lately come under my notice that it is the custom with some chemists to strengthen this solution for disinfecting purposes by adding a little chlorine water to it. This addition renders the liquid absolutely valueless for testing lichens, as it destroys the colouring-matter. I would therefore advise those who wish to have a satitfactory test to purchase the chlorinated lime in *dry* powder, and not absolutely destitute of odour, to mix it with an equal bulk of water, and pour off the clear liquid, and to prepare the solution afresh once a fortnight, to keep the solution in the dark, or to test its efficacy on *Pertusaria velata* before applying it to other lichens.—E. M. Holmes.

A New British Hepatic.—*Jungermannia Juratzkana*, Limpricht, was collected on Ben Lawers, August 12, 1880, W. West; also probably near Cwm Glas, Snowdon, August, 1880, by J. Cash and W. H. Pearson (specimen too meagre to be quite sure).—W. H. Pearson.

Sphagnum subbicolor, Hampe.—My friend Dr. Rehman having sent me an authentic specimen of the plant described under this name by Dr. Hampe ('Flora,' 1880, p. 440), I find it is identical with *S. papillosum*, Lindberg, of which of course it becomes a synonym.—R. Braithwaite.

"Aloe elegans, Tod. ined. *A. abyssinica*, Hort. Pan. Species elegantissima, acaulis, foliis perglaucis, validis elongatis, floribus plerumque luteis vel luteo-coccineis, pedunculo foliis longiore, ramoso paniculato. Infauste pro *A. abyssinica* commutata, differt in primis caule nullo; nec ulla cum nostra *A. percrassa* affinitas." We extract this description from Todaro's 'Index Seminum Hort. Reg. Bot. Panormitani' for 1880, as it is likely to be overlooked. The 'Index' contains also the name "*Salvia prætermissa*, Tod. ind.' [ined], of which plant no information is given but the following: "Simillima *Salviæ canariensi*, occurit in hortis sub nomine *A.* [*S.*] *ægyptiacæ*, Linn., a qua longe diversa."

Rudbeckia laciniata, L.—On August 18th, 1880, I saw about a dozen stems of this plant, from three to four feet high, growing up through a low thorn hedge, pasture on one side, a wet ditch and road on the other, near the railway station at Portbury, Somerset. There are cottage gardens within two hundred yards of the spot, but neither I nor any of my acquaintance have ever seen this composite in cultivation. On account of the protection afforded to its roots by the thick-set hedge, the plant will probably become well established, but the flower-heads were nearly all gathered by passers-by, and I had not an opportunity of observing if ripe fruits were produced.—Jas. W. White.

Hypnum imponens, Hedw.—In a recent excursion to Blackdown, Sussex, I met with this moss in some abundance around one of

the ponds on the summit of the Down, growing together with *Hypnum cupressiforme*, var. *ericetorum*, which it strongly resembles in habit. The moss being wet, I was struck with a feature by which it may readily be distinguished in the field, viz., the stem shows of a reddish brown colour through the leaves, so that each branch seems to have a dark line running up the centre. This, combined with the fact that towards the base of the stem the leaves turn brown, while those of *H. cupressiforme*, var. *ericetorum*, remain pale, enabled me to separate easily the two plants. *Brachyodus trichodes*, *Campylostelium saxicola*, and *Nardea adusta* still grow on Blackdown; the *Campylostelium* generally grows here, often on the same stone with *Brachyodus*, but is recognised by its taller seta, long teeth and longer operculum, and by fruiting in a more scattered manner and less freely. It seems to prefer always the more exposed edge of the stone on which it grows. The fruit is in best condition in January.—E. M. Holmes.

Extracts and Notices of Books and Memoirs.

NEW GENERA AND SPECIES OF PHANEROGAMS PUBLISHED IN PERIODICALS IN BRITAIN IN 1880.

The periodicals referred to in the compilation of this list are:—'Botanical Magazine,' 'Gardeners' Chronicle,' 'Icones Plantarum,' 'Journal of Botany,' 'Journal of the Linnean Society of London,' and 'Garden.'

Acantholimon calocephalum, *Aitchison & Hemsley* (Plumbagineæ).—Afghanistan. (Journ. Linn. Soc. xviii. 77.)

A. leptostachyum, *Aitch. & Hemsl.*—Afghanistan. (Id. p. 76.)

A. Munroanum, *Aitch. & Hemsl.*—Afghanistan. (Id.)

Acridocarpus hirundo, *S. Moore* (Malpighiaceæ).—W. Trop. Africa. (Journ. Bot. p. 1.)

Æchmæa multiceps, *Baker* (Bromeliaceæ).—Rio Janeiro. (Journ. Bot. p. 49).

Aerides pachyphyllum, *Rchb. f.* (Orchideæ). (Gard. Chron. xiv. 231.)

Albuca Nelsoni, *N. E. Br.* (Liliaceæ).—Natal. (Id. 198).

Aloe Atherstonei, *Baker.*—Cape. (Journ. Linn. Soc. xviii. 170).

A. Barteri, *Baker.*—Guinea. (Journ. Linn. Soc. xviii. 168.)

A. Bolusii, *Baker.*—Cape. (Journ. Linn. Soc. xviii. 179.)

A. constricta, *Baker.*—Trop. Africa. (Id. 168.)

A. crassipes, *Baker.*—Trop. Africa. (Id. 162.)

A. falcata, *Baker.*—Cape. (Journ. Linn. Soc. xviii. 181.)

A. gasterioides, *Baker.*—Cape. (Journ. Linn. Soc. xviii. 166.)

A. Greenii, *Baker.*—Cape. (Journ. Linn. Soc. xviii. 165; Bot. Mag. t. 6520.)

A. heteracantha, *Baker.*—(Journ. Linn. Soc. xviii. 161.)

A. Kraussii, *Baker.*—Cape. (Journ. Linn. Soc. xviii. 159.)

A. longistyla, *Baker.*—Cape. (Journ. Linn. Soc. xviii. 158.)

A. Macowani, *Baker.*—S. Africa. (Journ. Linn. Soc. xviii. 170.)

Aloe macracantha, *Baker*.—Cape. (Journ. Linn. Soc. xviii. 167.)
A. nitens, *Baker*.—Cape. (Journ. Linn. Soc. xviii. 171.)
A. Perryi, *Baker*.—Socotra. (Journ. Linn. Soc. xviii. 161.)
A. pratensis, *Baker*.—Cape. (Journ. Linn. Soc. xviii. 156.)
A. Schweinfurthii, *Baker*.—Trop. Africa. (Id. 175.)
A. sigmoidea, *Baker*.—Kaffraria. (Journ. Linn. Soc. xviii. 177.)
A. speciosa, *Baker*.—S. Africa. (Journ. Linn. Soc. xviii. 178.)
A. Thraskii, *Baker*.—Cape. (Journ. Linn. Soc. xviii. 180.)
Angræcum Christyanum, *Rchb. f.* (Orchideæ). (Gard. Chron. xiii. 806.)
A. hyaloides, *Rchb. f.*—Madagascar. (Gard. Chron. xiii. 264.)
Anthurium parvum, *N. E. Brown* (Araceæ). — Rio Janeiro. (Gard. Chron. xiv. 588.)
Aragoa lycopodioides, *Benth.* (Scrophulariaceæ).—New Granada. (Ic. Plant. t. 1325.)
Arisæma album, *N. E. Br.* (Araceæ).—Khasia. (Journ. Linn. Soc. xviii. 247.)
A. filicaudatum, *N. E. Br.*—Ceylon. (Id. 253.)
A. penicillatum, *N. E. Br.*—Hong Kong. (Id. 248, t. 5.)
A. pulchrum, *N. E. Br.*—India. (Id. 252, t. 6.)
Arnebia speciosa, *Aitchison & Hemsley* (Borragineæ).—Afghanistan. (Journ. Linn. Soc. xviii. 81.)
Aster Gerlachii, *S. Moore* (Compositæ).—China. (Journ. Bot. p. 262.)
Astragalus cerasinus, *Baker* (Leguminoseæ). — Afghanistan. (Journ. Linn. Soc. xviii. 47.)
A. immersus, *Baker*.—Afghanistan. (Journ. Linn. Soc. xviii. 45.)
A. Kuramensis, *Baker*.—Afghanistan. (Id. 46.)
A. luteo-cæruleus, *Baker*.—Afghanistan. (Id. 47.)
A. microdontus, *Baker*.—Afghanistan. (Id. 46.)
A. ptilocephalus, *Baker*.—Afghanistan. (Id. 47.)
A. rhizocephalus, *Baker*.—Afghanistan. (46.)
Astronia Samoensis, *S. Moore*.—Samoa (Journ. Bot. p. 3.)
Astrostemma, *Benth.* gen. nov. (Asclepiadaceæ).—A. spartioides, *Benth.*—Borneo. (Ic. Plant. t. 1311.)
Asystasia Charmian, *S. Moore* (Acanthaceæ).—Trop. Africa. (Journ. Bot. p. 38, t. 213.)
A. Welwitschii, *S. Moore*.—Angola. (Journ. Bot. p. 308.)
Avena oligostachya, *Munro* [name only] (Gramineæ).—Afghanistan. (Journ. Linn. Soc. xviii. 108.)
Barkeria cyclotella, *Rchb. f.* (Orchideæ). (Gard. Chron. xiii. 72.)
Barleria alata, *S. Moore* (Acanthaceæ).—Angola. (Journ. Bot. p. 266.)
B. Carruthersiana, *S. Moore*.—Angola. (Journ. Bot. p. 270.)
B. cyanea, *S. Moore*.—China. (Journ. Bot. p. 265.)
B. polyneura, *S. Moore*.—Angola. (Journ. Bot. p. 266.)
B. salicifolia, *S. Moore*.—Angola. (Journ. Bot. p. 268.)
B. Stellato-tomentosa, *S. Moore*.—Angola. (Id. p. 268.)
B. villosa, *S. Moore*.—Angola. (Journ. Bot. p, 267.)
B. violascens, *S. Moore*.—Angola. (Journ. Bot. p. 265.)

Barleria Welwitschii, *S. Moore*.—Angola. (Journ. Bot. p. 267.)

Beaucarnea Watsoni, *Baker* (Liliaceæ).—Mexico. (Journ. Linn. Soc. xviii. 236.)

Blepharis cuanzensis, *Welw.* (Acanthaceæ).—Angola. (Journ. Bot. p. 230.)

B. glumacea, *S. Moore*.—Angola. (Journ. Bot. p. 232.)

B. Noli-me-tangere, *S. Moore*.—Angola. (Journ. Bot. p. 231.)

B. Welwitschii, *S. Moore*.—Angola. (Journ. Bot. p. 231.)

Brassia euodes, *Rchb. f.* (Orchideæ).—New Granada. (Gard. Chron. xiii. 680.)

Bulbophyllum alopecurum, *Rchb. f.* (Orchideæ).—Burmah. (Gard. Chron. xiv. 70.)

B. Berenicis, *Rchb. f.* (Gard. Chron. xiv. 588.)

B. iners, *Rchb. f.*—Assam. (Gard. Chron. xiii. 776.)

B. inops, *Rchb. f.* (Gard. Chron. xiv. 620.)

Cacoucia velutina, *S. Moore* (Leguminosæ).—W. Trop. Africa. (Journ. Bot. p. 2.)

Calanthe Petri, *Rchb. f.* (Orchideæ).—Polynesia. (Gard. Chron. xiv. 326.)

Calophanes Hildebrandtii, *S. Moore* (Acanthaceæ).—E. Trop. Africa. (Journ. Bot. p. 8.)

C. thunbergiæflora, *S. Moore*.—S. Trop. Africa. (Id. p. 8.)

Caragana acaulis, *Baker* (Leguminosæ).—Afghanistan. (Journ. Linn. Soc. xviii. 44.)

Cardanthera justicioides, *S. Moore* (Acanthaceæ).—Nile River. (Journ. Bot. p. 70.)

Carex Buchanani, *Berggr.* (Cyperaceæ).—N. Zealand. (Journ. Bot. p. 104.)

Clematis leptomera, *Hance* (Ranunculaceæ).—China. (Journ. Bot. p. 257.)

C. Robertsiana, *Aitchison & Hemsley*.—Afghanistan. (Journ. Linn. Soc. xviii. 29.)

Cobæa campanulata, *Hemsl.* (Polemoniaceæ).—Ecuador. (Garden, xvii. 352.)

C. Trianæ, *Hemsl.*—N. Grenada. (Garden, xvii. 353.)

Coelogyne barbata, *Griff.* (Orchideæ).—Bootan, Khasia. (Gard. Chron. xiii. 9.)

C. peltastes, *Rchb. f.*—Borneo. (Gard. Chron. xiv. 296.)

Corydalis suaveolens, *Hance* (Papaveraceæ).—China. (Journ. Bot. p. 258.)

Cotyledon papillosa, *Aitchison & Hemsley* (Crassulaceæ).—Afghanistan. (Journ. Linn. Soc. xviii. 58.)

C. tenuicaulis, *Aitchison & Hemsley*.—Afghanistan. (Journ. Linn. Soc. xviii. 57.)

Crinum Kirkii, *Baker* (Amaryllidaceæ).—Zanzibar. (Bot. Mag. t. 6512.)

C. podophyllum, *Baker*.—Trop. Africa. (Bot. Mag. t. 6483.)

Crossandra Greenstockii, *S. Moore* (Acanthaceæ).—Trop. Africa. (Journ. Bot. p. 37.)

Cryptocoryne caudata, *N. E. Br.* (Araceæ).—Borneo. (Journ. Linn. Soc. xviii. 243, t 4.)

Cypripedium Petri, *Rchb. f.* (Orchideæ).—Malayan Archipelago. (Gard. Chron. xiii. 680.)

C. Spicerianum, *Rchb. f.* (Gard. Chron. xiii. 263.)

Dalhousiea africana, *S. Moore* (Leguminosæ).—Angola. (Journ. Bot. p. 2.)

Dasylirion pliabile, *Baker* (Liliaceæ).—Mexico. (Journ. Linn. Soc. xviii. 240.)

Dendrobium bostrychodes, *Rchb. f.* (Orchideæ). — Borneo. (Gard. Chron. xiv. 748.)

D. cinnabarinum, *Rchb. f.*)—Borneo. (Gard. Chron. xiv. 166.)

D. Phalænopsis, *Fitzgerald.*—North Australia and New Guinea. (Gard. Chron. xiv. 38.)

D. tetrachromum, *Rchb. f.*—Borneo. (Gard. Chron. xiii. 681.)

Dendrochilum Cobbianum, *Rchb. f.* (Orchideæ).—Phillippines. (Gard. Chron. xiv. 748.)

Dicliptera angolensis, *S. Moore* (Acanthaceæ).—Angola. (Journ. Bot. p. 362.)

D. Welwitschii, *S. Moore.*—Angola. (Journ. Bot. p. 362.)

Dipcadi Balfourii, *Baker* (Liliaceæ).— Socotra. (Gard. Chron. xiv. 424.)

Disa megaceras, *Hook. f.* (Orchideæ).—S. Africa. (Bot. Mag. t. 6529.)

Dracontium Carderi, *Hook. f.* (Araceæ).—Columbia. (Bot. Mag. t. 6523.)

Dracophyllum Kirkii, *Berggr.* (Epacrideæ).—N. Zealand. (Journ. Bot. p. 104,)

Ehretia resinosa, *Hance* (Borragineæ).—China. (Id. p. 299.)

Epidendrum chlorops, *Rchb. f.* (Orchideæ).—Mexico. (Gard. Chron. xiv. 524.)

E. Meseni, *Rchb. f.* (Gard. Chron. xiv. 390.)

Eragrostis Nevinii, *Hance* (Gramineæ). — China. (Journ. Bot. p. 302.)

Eremurus Aitchisoni, *Baker* (Liliaceæ).—Afghanistan. (Journ. Linn. Soc. xviii. 102.)

Eria Curtisii, *Rchb. f.* (Orchideæ). — Borneo. (Gard. Chron. xiv. 685.

Eriospermum brevipes, *Baker* (Liliaceæ).—Algoa Bay. (Gard. Chron. xiv. 231.)

Euonymus Forbesii, *Hance* (Celastrineæ).—China. (Journ. Bot. p. 259.)

Euphorbia Zambesiana, *Benth.* (Euphorbiaceæ).—E. Trop. Africa. (Ic. Plant. t. 1305.)

Gagea setifolia, *Baker* (Liliaceæ).— Afghanistan. (Journ. Linn. Soc. xviii. 101.)

Gasteria apicroides, *Baker* (Liliaceæ).—(Id. 197.)

G. cheilophylla, *Baker.*—Cape. (Journ. Linn. Soc. xviii. 184.)

G. excelsa, *Baker.*—Cape. (Journ. Linn. Soc. xviii. 193.)

G. fuscopunctata, *Baker.*—Cape. (Journ. Linn. Soc. xviii. 193.)

G. gracilis, *Hort. Saunders.*—S. Africa. (Id. 193.)

G. pallescens, *Baker.*—S. Africa. (Id. 190.)

G. parvifolia, *Baker.*—Cape. (Journ. Linn. Soc. xviii. 193.)

G. planifolia, *Baker.*—S. Africa. (Journ. Linn. Soc. xviii. 188.)

GASTERIA PORPHOROPHYLLA, *Baker*.—Cape. (Id. 190).
G. SPIRALIS, *Baker*.—Cape. (Journ. Linn. Soc. xviii. 189.)
G. SQUARROSA, *Baker*.—(Journ. Linn. Soc. xviii. 147.)
GLOSSOCALYX BREVIPES, *Benth.* (Monimiaceæ).—W. Trop. Africa. (Ic. Plant. t. 1302.)
G. LONGICUSPIS, *Benth.*—W. Trop. Africa. (Ic. Plant. t. 1301.)
HAWORTHIA AFFINIS, *Baker* (Liliaceæ).—Cape. (Journ. Linn. Soc. xviii. 213.)
H. BILINEATA, *Baker*.—Cape. (Journ. Linn. Soc. xviii. 213.)
H. BOLUSII, *Baker*.—Cape. (Journ. Linn. Soc. xviii. 215,)
H. GLAUCA, *Baker*.—Cape. (Journ. Linn. Soc. xviii. 203.)
H. GREENII, *Baker*.—Cape. (Journ. Linn. Soc. xviii. 202.)
H. ICOSIPHYLLA, *Baker*.—Cape. (Journ. Linn. Soc. xviii. 207.)
H. MINIMA, *Baker*.—Cape. (Journ. Linn. Soc. xviii. 215.)
H. PEACOCKII, *Baker*.—Cape? (Journ. Linn. Soc. xviii. 202.)
H. POLYPHYLLA, *Baker*.—Cape. (Journ. Linn. Soc. xviii. 213.)
H. TISLEYI, *Baker*.—Cape. (Journ. Linn. Soc. xviii. 208.)
HIBISCUS SCHIZOPETALUS, *Hook. f.* (Malvaceæ).—E. Africa. (Bot. Mag. t. 6524.)
HIERNIA, *S. Moore*, gen. nov. (Acanthaceæ). — H. ANGOLENSIS. Angola. (Journ. Bot. p. 197, t. 211.)
HIPPEASTRUM ANDREANUM, *Baker* (Amaryllidaceæ).—N. Grenada. (Gard. Chron. ii. 424.)
HYGROPHILA ULIGINOSA, *S. Moore* (Acanthaceæ).—Angola. (Journ. Bot. p. 197.)
HYPOESTES ANTENNIFERA, *S. Moore* (Acanthaceæ).—Trop. Africa. (Journ. Bot. p. 41.)
H. CALLICOMA, *S. Moore*.—Trop. Africa. (Journ. Bot. p. 41.)
H. STROBILIFERA, *S. Moore*.—Trop. Africa. (Journ. Bot. p. 40.)
ISOCHORISTE AFRICANA, *S. Moore* (Acanthaceæ).—Angola. (Journ. Bot. p. 309.)
JUSTICIA BREVICAULIS, *S. Moore* (Acanthaceæ).—Angola. (Journ. Bot. p. 341.)
J. CLEOMOIDES, *S. Moore*.—Angola. (Journ. Bot. p. 313, t. 214.)
J. LÆTA, *S. Moore*.—Angola. (Journ. Bot. p. 311.)
J. LAZARUS, *S. Moore*.—Angola. (Journ. Bot. p. 313.)
J. LOLIOIDES, *S. Moore*.—Angola. (Journ. Bot. p. 310, t. 214.)
J. MONECHMOIDES, *S. Moore*.—Angola. (Journ. Bot. p. 311.)
J. MOSSAMEDEA, *S. Noore*.—Angola. (Journ. Bot. p. 312.)
J. NEPETA, *S. Moore*.—Angola. (Journ. Bot. p. 312.)
J. SALSOLA, *S. Moore*.—Angola. (Journ. Bot. p. 340.)
J. SCABRIDA, *S. Moore*.—Angola. (Journ. Bot. p. 310.)
LÆLIA DORMANIANA, *Rchb. f.* (Orchideæ).—Brazil. (Gard. Chron. xiii. 168.)
LEPIDAGATHIS MEDUSAE, *S. Moore* (Acanthaceæ).—Trop. Africa. (Journ. Bot. p. 39.)
L. MYRTIFOLIA, *S. Moore*.—Trop. Africa.—(Journ. Bot. p. 38.)
L. PALLESCENS, *S. Moore*.—Angola. (Journ. Bot. p. 308,)
L. PENICULIFERA, *S. Moore*.—Trop. Africa. (Journ. Bot. p. 39.)
LILIUM NITIDUM, *Baker* (Liliaceæ).—California. (Gard. Chron. xiv. 198.)

Liparis formosana, *Rchb. f.* (Orchideæ).—Formosa. (Gard. Chron. xiii. 394.)

L. Stricklandiana, *Rchb. f.*—Assam? (Gard. Chron. xiii. 232.)

Loranthus bibracteolatus, *Hance* (Loranthaceæ). — China. (Journ. Bot. p. 301.)

L. curviflorus, *Benth.*—Trop. Africa. (Ic. Plant. t. 1304.)

Luddemannia Lehmanni, *Rchb. f.* (Orchideæ).—N. Grenada. (Gard. Chron. xiv. 685.)

Masdevallia Dayana, *Rchb. f.* (Orchideæ).—N. Grenada. (Gard. Chron. xiv. 295.)

M. Eduardi, *Rchb. f.*—Columbia. (Gard. Chron. xiv. 778.)

M. pulvinaris, *Rchb. f.* (Gard. Chron. xiii. 200.)

M. Roezlii, *Rchb. f.* (Gard. Chron. xiv. 778.)

M. swertiæfolia, *Rchb. f.*—N. Grenada. (Id. xiv. 390.)

M. xanthina, *Rchb. f.* (Gard. Chron. xiii. 681.)

Maxillaria arachnites, *Rchb. f.* (Orchideæ).—New Granada. (Gard. Chron. xiii. 394.)

Medinilla halogeton, *S. Moore* (Melastomaceæ).—Admiralty Islands. (Journ. Bot. p. 3.)

Mesopinidium incantans, *Rchb. f.* (Orchideæ). (Gard. Chron. xiii. 586.)

Millettia cognata, *Hance* (Leguminosæ). — China. (Journ. Bot. p. 260.)

Modecca aculeata, *Oliv.* (Passifloraceæ).—E. Africa. (Ic. Plant. t. 1317.)

Nepenthes Dyak, *S. Moore* (Nepenthaceæ).—Borneo. (Journ. Bot. p. 1, t. 206.)

Nepeta manchuriensis, *S. Moore* (Labiatæ).—Manchuria. (Journ. Bot. p. 5.)

Neuracanthus africanus, *T. And.* (Acanthaceæ).—Trop. Africa. (Journ. Bot. p. 37.)

N. decorus, *S. Moore.*—Angola. (Journ. Bot. p. 307.)

N. niveus, *S. Moore.*—Trop. Africa. (Journ. Bot. p. 37.)

N. scaber, *S. Moore.*—Angola. (Journ. Bot. p. 307.)

Nidularium giganteum, *Baker* (Bromeliaceæ).—Rio Janeiro. (Journ. Bot. p. 50.)

Octomeria Saundersiana, *Rchb. f.* (Orchideæ).—Brazil. (Gard. Chron. xiii. 264.)

Odontoglossum Eduardi, *Rchb. f.* (Orchideæ). (Id. 72.)

O. flaveolum, *Rchb. f.*—Bogota. (Gard. Chron. xiii. 41.)

O. Horsmani, *Rchb. f.*—New Granada. (Gard. Chron. xiii. 41.)

Oncidium chrysornis, *Rchb. f.* (Orchideæ).—Ecuador. (Gard. Chron. xiv. 620.)

O. diodon, *Rchb. f.* (Gard. Chron. xiv. p. 69.)

O. melanops, *Rchb. f.*—Ecuador. (Gard. Chron. xiv. 620.)

O. præstans, *Rchb. f.* ("n. sp.: hybr.?") (Id. 296).

O. xanthocentron, *Rchb. f.*—S. America. (Id. xiii. 104.)

Onobrychis dasycephala, *Baker* (Leguminosæ).—Afghanistan. (Journ. Linn. Soc. xviii. 48.)

O. microptera, *Baker.*—Afghanistan. (Id.)

ONOBRYCHIS SPINOSISSIMA, *Baker*.—Afghanistan. (Id. 49.)

OTOMERIA OCULATA, *S. Moore* (Rubiaceæ).—E. Trop. Africa. (Journ. Bot. p. 4.)

PENTANISIA OURANOGYNE, *S. Moore* (Rubiaceæ).—E. Trop. Africa. (Journ. Bot. p. 4.)

PARSEA NAMNU, *Oliv.* (Laurineæ).—China. (Ic. Plant. t. 1316.)

PERTYA AITCHISONI, *C. B. Clarke* (Compositæ).—Afghanistan. (Journ. Linn. Soc. xviii. 72.)

PETALIDIUM COCCINEUM, *S. Moore* (Acanthaceæ). — Angola. (Journ. Bot. p. 225.)

P. GLANDULOSUM, *S. Moore*.—Angola. (Journ. Bot. p. 226.)

P. LEPIDAGATHIS, *S. Moore*.—Angola. (Journ. Bot. p. 227.)

P. LORANTHIFOLIUM, *S. Moore*.—Angola. (Journ. Bot. p. 227.)

P. PHYSALOIDES, *S. Moore*.—Angola. (Journ. Bot. p. 225, t. 212.)

P. RUPESTRE, *S. Moore*.—Angola. (Journ. Bot. p. 226.)

P. WELWITSCHII, *S. Moore*.—Angola. (Id. p. 227, t. 212,)

PHÆDRANASSA SCHIZANTHA, *Baker*. (Gard. Chron. xiv. 556.)

PHAJUS HUMBLOTII, *Rchb. f.* (Orchideæ).—Madagascar. (Gard. Chron. xiv. 812.)

PHAYLOPSIS ANGOLANA, *S. Moore* (Acanthaceæ).—Angola. (Journ. Bot. p. 229.)

P. OBLIQUA, *T. And.*—Angola. (Journ. Bot. p. 229.)

PHOTINIA CRENATO-SERRATA, *Hance* (Rosaceæ).—China. (Journ. Bot. p. 261.)

PHYLLACHNE HAASTII, *Berggr.* (Stylidieæ).—N. Zealand. (Journ. Bot. p. 104.)

PLEUROSPERMUM CORYDALIFOLIUM, *Aitchison & Hemsley* (Umbelliferæ).—Afghanistan. (Journ. Linn. Soc. xviii. 62.)

P. PULCHRUM, *Aitchison & Hemsley*.—Afghanistan. (Journ. Linn. Soc. xviii. 63.)

POLYGONUM BIARISTATUM, *Aitchison & Hemsley* (Polygonaceæ).—Afghanistan. (Journ. Linn. Soc. xviii. 90.)

P. COMPACTUM, *Hook. f.*—Japan. (Bot. Mag. t. 6471.)

PONERA PELLITA, *Rchb. f.* (Orchideæ). (Gard. Chron. xiv. 8.)

POTENTILLA COLLETTIANA, *Aitchison & Hemsley* (Rosaceæ).—Afghanistan. (Journ. Linn. Soc. xviii. 53.)

POTHOS CELATOCAULIS, *N. E. Br.* (Araceæ).—Borneo. (Gard. Chron. xiii. 200.)

PRIMULA OBCONICA, *Hance* (Primulaceæ).—China. (Journ. Bot. p. 234.)

QUERCUS BECCARIANA, *Benth.* (Cupuliferæ).—Borneo. (Ic. Plant. t. 1315.)

Q. JENKINSII, *Benth.*—Assam. (Ic. Plant. tt. 1312, 1313.)

Q. MAINGAYI, *Benth.*—Penang. (Ic. Plant. t. 1314.)

RENANTHERA STORIEI, *Rchb. f.* (Orchideæ).—Philippines. (Gard. Chron. xiv. 296.)

RESTREPIA FALKENBERGII, *Rchb. f.* (Orchideæ.—New Granada? (Gard. Chron. xiii. 232.)

RHODODENDRON AFGHANICUM, *Aitchison & Hemsley* (Ericaceæ).—Afghanistan. (Journ, Linn. Soc. xviii. 75.)

R. COLLETTIANUM, *Aitchison & Hemsley*.—Afghanistan. (Id.)

Rubus Ecæ, *Aitchison* (Rosaceæ).—Afghanistan. (Id. 54.)
Ruellia amabilis, *S. Moore* (Acanthaceæ).—Trop. Afr. (Id. p. 7.)
R. bignoniæflora, *S. Moore*.—Angola. (Journ. Bot. p. 198.)
R. diversifolia, *S. Moore*.—Angola. (Journ. Bot. p. 198.)
R. Portellæ, *Hook. f.*—Brazil. (Bot. Mag. t. 6498.)
R. Sclerochiton, *S. Moore*.—Trop. Africa. (Journ. Bot. p. 7.)
Sarcochilus rubricentrum, *Fitzgerald* (Orchideæ).—Queensland. Gard. Chron. xiv. 38.)

Saxifraga afghanica, *Aitchison & Hemsley* (Saxifragaceæ).—Afghanistan. (Journ. Linn. Soc. xviii. 56.)

Scabiosa afghanica, *Aitchison & Hemsley* (Dipsaceæ).—Afghanistan. (Journ. Linn. Soc. xviii. 67.)

Scilla tricolor, *Baker* (Liliaceæ).—Port Elizabeth? (Gard. Chron. xiv. 230.)

Sedum Liebmannianum, *Hemsl.* (Crassulaceæ).—Mexico. (Gard. Chron. xiv. 38.)

S. retusum, *Hemsl.*—Mexico. (Gard. Chron. xiv. 38.)

Siphonoglossa Nummularia, *S. Moore* (Acanthaceæ).—Kaffraria. (Journ. Bot. p. 40.)

Siphonostegia læta, *S. Moore* (Labiatæ).—China. (Id. p. 5.)

Stellularia, *Benth.*, gen. nov. (Scrophulariaceæ): S. nigrescens.—W. Trop. Africa. (Ic. Plant. t. 1318.)

Stenia guttata, *Rchb. f.* (Orchideæ).—Peru. (Gard. Chron. xiv. 134.)

Stenomesson luteo-viride, *Baker* (Amaryllidaceæ).—Ecuador. (Bot. Mag. t. 6508.)

Stimpsonia cbispidens, *Hance* (Primulaceæ).—China. (Journ. Bot. p. 234.)

Thrixspermum Moorei, *Rchb. f.* (Orchideæ).—New Britain (Gard. Chron. xiii. 104.)

Thunbergia affinis, *S. Moore* (Acanthaceæ).—E. Trop. Africa. (Journ. Bot. p. 5.)
T. angolensis, *S. Moore*.—Angola. (Journ. Bot. p. 195.)
T. armipotens, *S. Moore*.—Angola. (Journ. Bot. p. 195.)
T. Cycnium, *S. Moore*.—Angola. (Journ. Bot. p. 194.)
T. hyalina, *S. Moore*.—Angola. (Journ. Bot. p. 195.)
T. huillensis, *S. Moore*.—Angola. (Journ. Bot. p. 194.)
T. Schweinfurthii, *S. Moore*.—Trop. Africa. (Journ. Bot. p. 6.).

Tillandsia distachya, *Baker* (Bromeliaceæ).—British Honduras. (Gard. Chron. xiii. 200.)

Tococa coriacea, *S. Moore* (Melastomaceæ).—Central America. (Journ. Bot. p. 3.)

Tripterygium Bullockii, *Hance* (Celastrineæ).—China. (Journ. Bot. p. 259.)

Wormia Burbidgei, *Hook. f.* (Dilleniaceæ).—Borneo. (Bot. Mag. t. 6531.)

Yucca Peacockii, *Baker* (Liliaceæ).—Mexico? (Journ. Linn. Soc. xviii. 223.)

Zingiber corallinum, *Hance* (Zingiberaceæ).—China. (Journ. Bot. p. 301.)

THE COFFEE-LEAF DISEASE.

Mr. Marshall Ward has been prosecuting his work at *Hemileia vastatrix* (the coffee-leaf disease) in Ceylon with much success, and has issued a Second Report, containing not only much that is new about the fungus, but many observations on its relation to the coffee-plant. Among the numerous experiments made by Mr. Ward, one in which he propagated the disease by sowing the yellow spores (uredospores) is the most interesting. He has also continued to work with some success at the history of the teleutospores —which, on germinating, produce a four-chambered promycelium, whence arise four "conidia" at the tips of lateral branches. These "conidia" germinate in various nutritive fluids, and form a short delicate tube; they also begin germination on the coffee-leaf, but soon die. The farther history of these bodies is of the utmost importance to the investigation. On the "coral-like" mycelium, Mr. Ward has discovered numerous haustoria. He has also under supervision several experiments as to the application of remedial measures on a large scale.

In an Appendix (H) there is an account of experiments made by Mr. Ward to satisfy himself of the fact that the wind conveys fungus spores from place to place. The examination of the glass slips exposed showed numerous spores of different kinds, including those of the *Hemileia*. This is interesting in view of the absurd objections made by Prof. Baldwin to Mr. George Murray's similar experiments with the conidia of *Phytophthora infestans*, de By. ('Journal of Botany,' December, 1880). In this Report Mr. Ward shows that he has gathered a great mass of details, of which we hope at a later stage of the investigation to give a full account.

Prof. Ralph Tate has published 'A Census of the indigenous Flowering Plants and Ferns of extra-tropical South Australia,' on the same principle as Baron von Mueller's 'Census of the Plants of Australia,' referred to at p. 92.

The last part (vol. xiv., pt. 1) of the 'Transactions of the Botanical Society of Edinburgh' contains an interesting paper, by Mr. G. M. Thomson, on 'The Flowering Plants of New Zealand and their Relation to the Insect Fauna.'

The recent (January) part of the 'Proceedings of the Geologists' Association' contains Mr. G. S. Boulger's paper 'On the Geological and other causes of the Distribution of the British Flora,' of which we gave a summary at p. 62 of this Journal for 1880.

We are indebted to Mr. W. Phillips for a useful list of 'The Hymenomycetæ of Shropshire,' reprinted from the 'Transactions' of the Shropshire Archæological Natural History Society. We regret that the author has followed Cooke's 'Handbook' in giving what some persons call "English names" to the Fungi enumerated. Nothing can possibly be gained by calling *Polyporus vulgaris* "Common effused Polyporus," or *Auricularia mesenterica* "Entire Auricularia."

The last part, published in February, of 'Hooker's Icones Plantarum' contains figures and descriptions (the former very roughly executed) of some interesting novelties, including a new genus of *Anacardiaceæ* (*Micronychia*, Oliv.), and one of *Cyperaceæ* (*Actinoschænus*, Benth.)

Mr. Bernard Hobson, of Sheffield, has issued a little pamphlet of thirty-two pages, entitled 'What to observe in the Sheffield Botanic Garden,' which is in many respects a model of what such a guide should be. We have seldom met with a greater amount of accurate information pleasantly conveyed in so small a compass. Printed apparently for private distribution, we learn that the impression is already exhausted. We trust that Mr. Hobson will issue a second edition for sale to the public, as the pamphlet can hardly fail to interest and instruct any intelligent person who may visit the Sheffield gardens.

The recently issued part (2nd ser., vol. iii., pt. 1), of the 'Atti della Società Crittogamologica Italiana' contains papers by G. Passerini on the Cryptogams observed upon Tobacco; a list of the Lichens of Gargano, by A. Jatta; a description of a new Agaric, *Agaricus* (*Pleurotus*) *parthenopejus*, by O. Comes; and 'Nova Addenda ad Mycologiam Venetam,' by C. Spegazzini.

Mr. J. E. Bagnall has commenced in the 'Midland Naturalist' a flora of Warwickshire, which, so far as can be judged from the introductory matter,—all that has yet appeared,—promises to be a careful record of our present knowledge of the Botany of the county. We have before expressed our approval of the prominence given to local observations in this useful periodical.

We have received 'Practical Botany for Elementary Students,' by Dr. Houston, which forms one of 'Stewart's Educational Series.' The author describes at length what may be observed by the dissection of actual specimens of some of the more important types of the natural orders represented in Britain; and his book may be useful to those who have previously gone through some general introduction to Botany, and are anxious to put their knowledge to the test by the examination of living plants. The possible plant which ornaments the cover should be suppressed in future issues.

New Books.—J. D. Hooker, 'Flora of British India,' part viii. (*Rubiacæ—Compositæ*) (L. Reeve, 10*s*. 6*d*.). —V. A. Poulsen, 'Botanische Mikrochemie' (Cassel, Fischer).—B. Frank, 'Die Krankheiten der Pflanzen' (Breslau, Trewendt).

Articles in Journals.

February.

[*Coulter's*] *Botanical Gazette*.—E. C. Howe, '*Carex Sullivantii*, Boott, a hybrid.'—G. Vasey, '*Trichostemma Parishii*,' sp. nov.—W. K. Higley, 'Carnivorous Plants' (contd.) 'Catalogue of Indiana Plants.'

Botanische Zeitung.—H. Hoffman, 'Cultural Experiments upon

Variation.'—R. Cario, 'Anatomical Researches upon *Tristicha hypnoides*' (concluded).—H. Wendland, 'On the *Borassineæ*.'

Botaniska Notiser.—F. W. C. Areschoug, 'On the Fruit of *Borragineæ* and *Labiatæ*.'—K. B. J. Forasell, 'Note upon *Rubus maximus*, L.'

Bulletin de la Société Botanique de Genève.—J. Muller, 'Genevan *Characeæ*.'—Id., 'New Classification of the Vegetable Kingdom.'—S. Calloni, 'Pistillody of Stamens in *Persica vulgaris*.'—Id., 'Monstrosity of flower of *Erythronium Dens-canis*.'—Id., 'On the corm of *Ranunculus bulbosus*.'

Hedwigia.—R. Wolling, 'Marine Algæ of Heligoland' (concluded).

Journal of Linnean Society (Botany, vol. xviii., no. 110).—J. G. Baker, 'On a Collection of Plants made by L. Kitching in Madagascar' (2 tab.: *Kitchingia* and *Rhodocodon* [see Journ. Bot., p. 32]).—G. Bentham, 'Notes on *Orchideæ*.'—Id., 'Notes on *Cyperaceæ*.'

Magyar Növénytani Lapok.—J. Schaarschmidt, 'Specimen Phycologiæ Æquatoriensis.'—(Suppl.) A. Kanitz, 'Plantæ Romaniæ hucusque cognitæ' (contd.)

Midland Naturalist.—J. E. Bagnall, 'The Flora of Warwickshire.'—A. W. Wills, 'The *Desmideæ* of N. Wales.' 'Plants Flowering at Falmouth, December, 1880, and January, 1881.'

Œsterreichische Botanische Zeitschrift.—A. Kerner, '*Seseli Malyi*,' n. sp.—M. Gandoger, 'Pugillus plantarum' (contd.: forms of *Potamogeton crispus*, *Lygeum sparteum*, and *Hordeum murinum*.')—P. G. Strobl, 'Flora of Etna' (contd.)

Science Gossip.—'Science-Gossip Botanical Exchange Club Report for 1880.'

Botanical News.

Dominique Alexandre Godron was born 25th March, 1807, at Hayange, where his father was engaged in the iron works. Educated for the medical profession at Strassburg, on the outbreak of cholera in 1832 he was appointed assistant-surgeon in the department of the Moselle. He married in 1834, and thereupon settled at Nancy. He was compelled, on the plea of health, to relinquish his official duties in 1850, but in 1854 he willingly undertook the Professorship of Natural History in the newly founded Faculty of Sciences at Nancy, which he retained until 1872. He died in that place on 16th August, 1880, and left his collections, including his types, to the Faculty above-mentioned. Amongst his numerous scientific publications may be mentioned—the 'Flore de Lorraine,' 3 vols., 1843–44, with Supplements in 1845, and second ed. in 2 vols. in 1857; 'De l'espèce et des races dans les êtres organisés,' 2 vols., 1859, an important contribution to the species-question; and the work in conjunction with Grenier, by which he is most widely known, the admirable 'Flore de France,' in three volumes, the publication of which extended from 1848 to 1856.

Irish Botany has suffered a serious loss in the death of Isaac Carroll, of Cork. He died on the 7th of September, 1880, at the comparatively early age of fifty-two, and at the time of his death he was engaged in the exploration of the extreme south-western parts of the county of Cork, in aid of which he had received a grant from the Royal Irish Academy. One of the oldest and most valued friends of the late David Moore, of Glasnevin, he was one of the best and most trusted contributors to the 'Contributions towards a Cybele Hibernica' (1866), and had, in partnership with the Rev. T. Allin, prepared an excellent new Flora of Cork, of which the MS. is left in the hands of the authorities at the Queen's College, in which institution he had of late been employed arranging and naming the herbarium of British plants, a task which no one in his own county was more competent to carry out. A most accurate and careful observer, Isaac Carroll identified, with scrupulous interest, all the plants of his own county. His MS. 'Flora' includes the Lichens and Mosses of the county. and will, we trust, be given to the public by the authorities of Queen's College. Isaac Carroll did not limit his attention to the flowering plants alone. He was an excellent lichenologist, and published many lichenological papers, several of them in the earlier volumes of this Journal. In 1864 he accompanied Mr. Joseph Shackleton, of Lucan, and Dr. David Moore, to Lapland, for the express purpose of studying the alpine flora and collecting lichens in this desolate region: he also visited Iceland. Many of his specimens were purchased by the authorities of the British Museum. Another portion, including mosses, Jungermanniæ, lichens, and sea-weeds, are preserved in the herbarium at Queen' College, Cork; they form a fine collection, are well mounted, and are in excellent preservation. In the early summer of 1880 Mr. Carroll's health, already weak for some years past, completely gave way before he had accomplished much of his undertaking, and he retired to the little seaside village of Aghada, hoping to regain health and strength sufficient to enable him to resume his botanical labours. This he was not permitted to accomplish; and Irish botanists have to regret the loss of one of the most exact, truthful, and diligent members of their little band. We understand that Mr. A. G. More, to whom we are indebted for this notice, is preparing a fresh supplement for the 'Cybele Hibernica,' and in this the name of Mr. Isaac Carroll will be often quoted. Other younger botanists, though too few in Ireland, are already pushing forward their explorations throughout the less known districts. Mr. S. A. Stewart, of Belfast, Mr. Richard Barrington, and Mr. H. C. Hart have done good work already, and we hope ere long to see materials collected upon which may be founded an improved edition of Moore and More's 'Cybele Hibernica.'

We are glad to learn that Mr. J. E. Griffith, of Bangor, has in contemplation a complete Flora of Anglesea, in which the Cryptogams will be included. We have noticed what may be considered his preliminary list at p. 28 of this Journal.

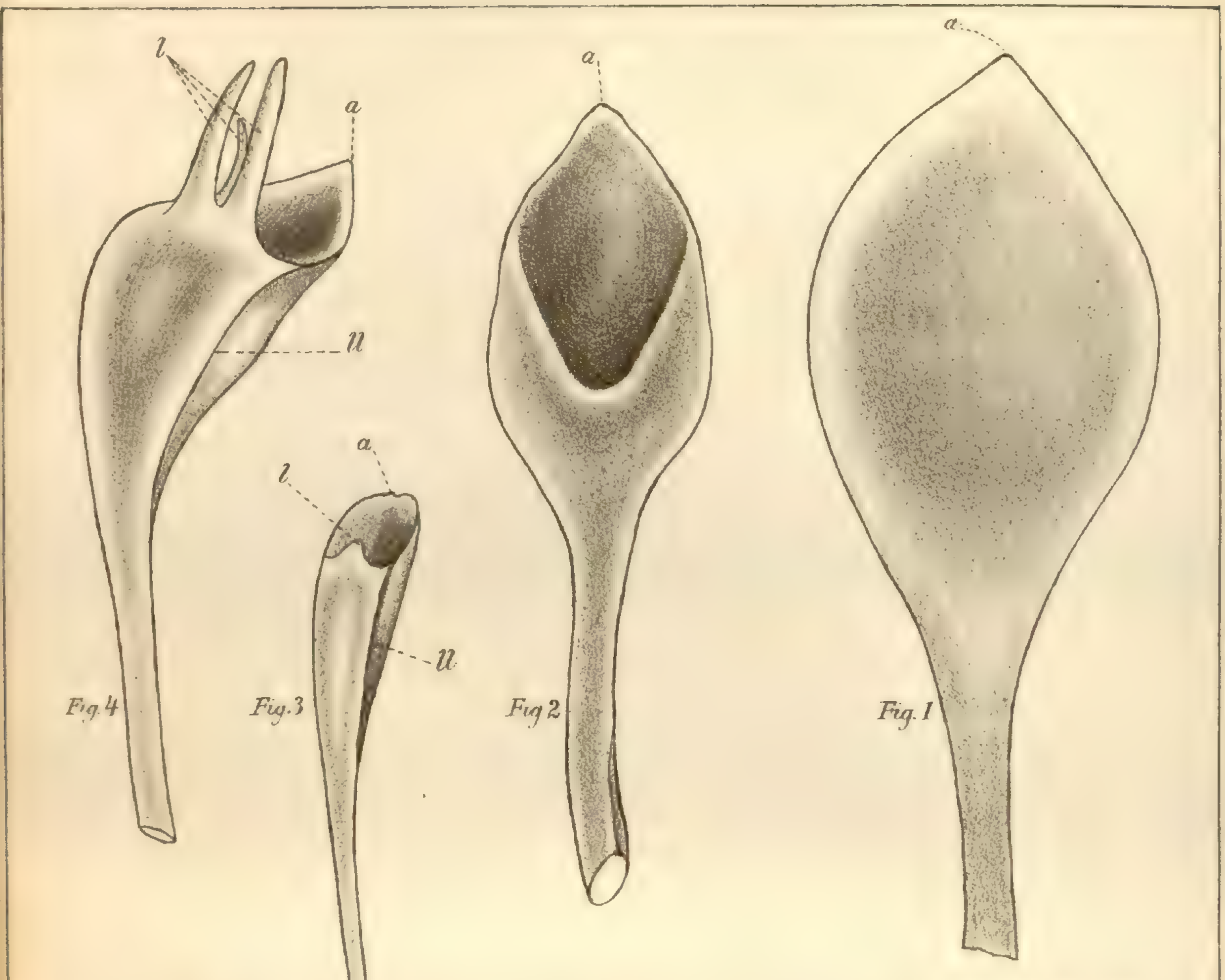
Fig. 1

Fig 2

G. Waterston & Sons, Lith.rs Edin.r

A. Dickson, del.t

Tab. 219.



G. Waterston & Sons, Lith.rs Edin.r

A. Dickson, del.t

Original Articles.

ON THE MORPHOLOGY OF THE PITCHER OF *CEPHALOTUS FOLLICULARIS*.

By Alexander Dickson, M.D., Professor of Botany in the University of Edinburgh.*

(Plates 219 & 220).

In a paper on the Structure of the Pitcher of *Cephalotus follicularis*, read at the Plymouth meeting of the British Association, and published in the 'Journal of Botany' in January, 1878, I pointed out the remarkable difference as to the position of the lid of the pitcher between *Cephalotus*, on the one hand, and *Sarracenia* and *Nepenthes*, on the other. In *Cephalotus* the lid is placed on that side of the orifice of the pitcher *nearest* to the main axis, while in *Sarracenia* and *Nepenthes* it is on the side *farthest* from the main axis. At that time I was inclined to assume that the pitcher-lid in *Cephalotus* represented the extremity of the leaf, and this led me to suggest—although under reserve—that, while the pitcher in *Sarracenia* and *Nepenthes* appears as a pouching of the leaf from the upper surface, in *Cephalotus*, on the other hand, the pouching would, on the assumption indicated, be from the lower leaf-surface. Developmental evidence is at present scarcely attainable, requiring, as it would do, the sacrifice of many specimens of a plant not very easy of cultivation, and never very common; and in absence of this we are glad to meet with any teratological deviations which may throw light upon the subject.

Some time ago our esteemed foreman at the Botanic Garden here, Mr. Robert Lindsay, told me he had once seen what appeared to him to be a pitcher springing from an ordinary leaf, and I asked him to look at our plants from time to time in hope of abnormalities presenting themselves. The result has been the detection of several very interesting and instructive forms intermediate between the ordinary foliage-leaf and the pitcher; and I have now very great satisfaction in being able to pronounce a decided opinion on the general morphological relations of the *Cephalotus*-pitcher, even although I have to admit the complete reversal of my previous conceptions of the subject.

These abnormal leaves are four in number, of small size and feeble development. I shall now describe them in order of their extent of deviation from the form of the ordinary foliage-leaf towards that of a pitcher.

---

* Read before the Botanical Society of Edinburgh, March 10th, 1881.

Specimen A (Plate 219, fig. 2).—In general form this closely resembles the foliage-leaf, presenting a somewhat ovate blade narrowed gradually below into the leaf-stalk. It exhibits, however, on the upper surface a somewhat elliptical spoon-like excavation involving the terminal two-thirds, or thereby, of the lamina. This excavation is deepest at the end next the petiole, where it is bounded by a pretty sharply defined border. On the lower surface, towards the leaf-apex, there is distinct development of a keel-like ridge in the middle line. In this specimen we have the pitcher cavity foreshadowed by the spoon-like excavation, while the keel-like ridge represents the middle dorsal wing, which is a very prominent feature in the perfect pitcher.

Specimen B (Plate 219, fig. 3).—Here the excavation has advanced to the formation of a narrow somewhat elongated funnel with oblique mouth, the *far* side of the orifice, from the main axis, extending out beyond the *near;* the leaf-apex (in this case a little truncated) being at the far side of the orifice. The *near* side of the orifice, instead of exhibiting the simply rounded excision seen at the deeper end of the spoon-like excavation in the first mentioned specimen, is here developed in the middle line into a small but distinct tooth-like projection. This lobe is the first indication of the pitcher-lid. As in the former specimen, there is here, also, a keel-like ridge in the middle line on the lower leaf-surface.

Specimen C (Plate 219, fig. 4).—In this we have a still greater approximation to the pitcher-form. As in the last, we have a funnel-like structure with oblique mouth, the far side of which retains, however, more of the original pointed form of the leaf-apex. The greater advance towards the ascidium consists in the greater development of the structure representing the pitcher-lid, which is of considerable size and deeply cut into three lobes, two longer and stronger lateral lobes, and a shorter, feebler median one. Here, again, we have along the middle dorsal line a keel-like projection.

Specimen D (Plate 219, figs. 5 and 6).—In this, a misthriven leaf of very small size, we have a still greater approximation to the normal ascidium. The lid is relatively larger, and exhibits two lobes separated by a considerable notch, in this respect according more with the structure of the normal lid, where we have the extremity emarginate, corresponding to the dichotomous disposition of the principal veins. Further, in addition to the middle dorsal keel or wing, which is more pronounced in this than in the other specimens, we have, on one side, a slight indication (Plate 219, figs. 5 and 6, *lw*) of one of the oblique lateral wings of the normal pitcher. The far side of the orifice of the funnel has still the pointed form of the apex of the foliage-leaf.

In all these specimens it is to be noted that the tip of the middle dorsal keel or wing and the apex of the leaf are coincident. Inasmuch, however, as none of them show the slightest trace of the remarkable development of the corrugated rim, with its inflexed teeth, it may still be open to question what represents the leaf-margin in the perfect pitcher. If the lower (outer) border of

the corrugated rim represents the leaf-margin, then the tip of the middle dorsal wing would represent the leaf-apex. If, on the other hand, the leaf-margin is represented by the line of the inflexed teeth, then the middle dorsal tooth (Plate 219, fig. 6, *mdt*), in line with the middle dorsal wing and conspicuous by its larger size, would represent the leaf-apex.* Of the two possibilities I am disposed to look upon the first as the more probable; partly from the coincidence of the tip of the middle dorsal keel or wing with the leaf-apex in the abnormal specimens mentioned above, and partly from the vascular distribution in the normal pitcher. In the latter, the vessels from the extremity of the petiole divide into two sets, an upper going to supply the lid, and a lower which diverge radiatingly and are distributed to the pitcher-wall. Of the last mentioned set there are three somewhat more marked than the others, viz., a lateral vein on either side curving downwards and outwards past the lower extremity of the lateral wing, and passing obliquely across the lateral glandular patch to curve upwards towards the pitcher orifice, and a middle vein which runs in the ventral wall of the pitcher to the bottom, whence it passes on to the dorsal surface, where, however, it leaves the pitcher-wall, and, passing into the middle dorsal wing, continues its course just within the curiously expanded edge of that structure. In my opinion this course of the middle vein seems to prove that the middle dorsal wing is a development of the midrib, and that its apex really represents the leaf-apex.

In the three specimens exhibiting the funnel-shaped excavation, it is to be observed that the sharp margin of the far side of the orifice of the funnel—representing, as it undoubtedly does, the margin of the leaf—is continuous with an angular ridge, or *lateral line*, as we may call it, on either side of the funnel (Plate 219, figs. 3. 4, and 5, *ll*). These "lateral lines" can scarcely be anything else than the downward continuations of the leaf-margin; and if they are so, it follows that all above the "lateral lines" is *upper*, all below them *lower* leaf-surface. In this way I am led to view the pitcher-lid as wholly developed from the upper leaf-surface, with which *both* its aspects are continuous. This conclusion might, indeed, have been anticipated from inspection of Specimen A, where the portion of the margin of the spoon-like excavation next the petiole belongs manifestly to the upper leaf-surface. In the perfect pitcher the "lateral lines" are distinctly recognisable as ridges, one on either side, running from the junction of the corrugated rim with the base of the lid down towards the extremity of the petiole, where they disappear.

To convert, in idea, one of the funnel-like structures above described into the normal *Cephalotus*-pitcher, we must imagine that side of the funnel nearest to the main axis as remaining comparatively stationary, while the far side of the funnel becomes calceolately pouched to an enormous extent, forming, in fact,

* Somewhat similarly, the teeth in line with the lateral wings of the pitcher are also of conspicuous size.

almost the entire pitcher. The pitcher-leaf of *Cephalotus*, with its calceolate pouching, whereby the apex of the lamina is curved round so as to become approximated to its base, may not inaptly be compared to the well-known "hammer-headed" upper petals of *Aconitum*, where we have also petiolated leaf-organs with similar pouching of the lamina and approximation of apex to base. The interest of this comparison is further heightened by the circumstance that in both cases the internal surface is developed (although for very different purposes) as a secreting apparatus. In illustration of the parallel, I give an outline figure of the pitcher-leaf of *Cephalotus* (Plate 219, fig. 6), placed in such a position—with petiole nearly vertical—as will enable any one at a glance to compare it with the nectariferous petal of *Aconitum* (Plate 219, fig. 7), a figure of which I have borrowed from Prof. Asa Gray's 'Text Book.'

The conclusions to which I have been led may thus briefly be stated:—

1st. That the pitcher results from a calceolate pouching of the leaf-blade from the upper surface.

2nd. That the apex of the leaf is on the far side of the pitcher-orifice from the main axis and from the lid, and is probably represented by the tip of the middle dorsal wing.

3rd. That the pitcher-lid represents an outgrowth or excrescence from the upper leaf-surface.

In this place I must mention that Dr. Masters, in his 'Teratology' (p. 314), says that "in *Cephalotus follicularis* rudimentary or imperfect pitchers may be frequently met with in which the stalk of the leaf is tubular, and bears at its extremity a very small rudimentary leaf-blade." Unless there is some error of description, the cases here referred to must have been exceedingly unlike mine; but whatever they may have been, it is quite certain that they had not been sufficient to enable Dr. Masters to come to any very definite opinion on pitcher-morphology. This may be gathered from his immediately following conclusions as to ascidia in general, which run thus:—"It is not in all cases easy to trace the origin and true nature of the ascidium, as the venation is sometimes obscure. If there be a single well-marked midrib the probability is that the case is one of cohesion of the margins of the leaf; but if the veins are all of about equal size, and radiate from a common stalk, the pouch-like formation is probably due to dilatation and hollowing of the petiole.* Again, when the result of a union of the margins of the leaf, the pitcher is generally less regular than when formed from the hollow end of a leaf-stalk. Further information is especially needed as to the mode of development and formation of these tubular organs so as to ascertain clearly when they are the result of a true cupping process, and when of cohesion of the margins of one or more leaves."

In conclusion, I may refer to the principal points for comparison,

* To this category Dr. Masters would, no doubt, relegate the case of *Cephalotus*. It seems just possible that in the monstrosities of *Cephalotus* referred to by him the rudiment of the pitcher-lid has been mistaken for a "rudimentary leaf-blade."

or contrast, between the pitcher of *Cephalotus*, on the one hand, and those of *Sarracenia* and *Nepenthes*, on the other, in both of which latter the development has been examined—in *Sarracenia* by Professor Baillon,* and in *Nepenthes* by Sir Joseph D. Hooker.†

As regards *Sarracenia*, Baillon's observations and conclusions are briefly as follows :—In *S. purpurea* the leaf appears at first as a small convex mammilla. A little later the base of the organ becomes somewhat dilated and a little concave towards the inner surface. This dilatation is the sheathing base of the petiole, and at a later period becomes considerably developed. It has nothing to do with the formation of the pitcher. This last appears somewhat later as a small depression or fossa a little to the inner side of the extremity of the cone which represents the young leaf. This fossa—the result of inequality of development in the different portions of the extremity of a leaf whose petiolar and vaginal portions already exist—he holds to be formed on the upper surface of the lamina. The fully-developed pitcher he views as corresponding morphologically to a peltate leaf like that of *Nelumbium*. The large but shallow inverted cone which forms the leaf-blade in *Nelumbium* becomes in *Sarracenia* deeper and narrower, so as ultimately to present the form of a long obconical horn. The pitcher-lid he considers as merely the terminal lobe of the peltate limb.

If Baillon is right—as probably he is—in viewing the pitcher of *Sarracenia* as a modification of a peltate leaf, it would, in this respect, seem to differ considerably from that of *Cephalotus*. In *Sarracenia* the whole outer surface of the pitcher, on the near as well as on the far side from the main axis, would represent *lower* leaf-surface ; whereas in *Cephalotus* the upper surface of the pitcher-lid and the portion of the outer surface of the pitcher-wall intervening between it and the extremity of the petiole, and bounded laterally by the "lateral lines" above referred to, belong to *upper* leaf-surface.

As regards *Nepenthes*, Hooker's observations conclusively show that the pitcher-cavity is the result of a pouching from the upper leaf-surface, and that the leaf-apex is represented by the "styliform process" which projects from behind the junction of the lid and pitcher. The lid here must be viewed as an outgrowth or excrescence from the upper leaf-surface, just as in *Cephalotus:* with this difference, however, that while in *Cephalotus* the lid springs from the side of the pitcher orifice *nearest* to the main axis, the lid in *Nepenthes* springs from the side *farthest* from it.

The pitcher-leaf of *Nepenthes* presents, as is well known, very considerable difficulties to the morphologist who wishes to reduce its parts to the terms of "petiole" and "lamina." The flatly expanded portion, sometimes sessile and sometimes supported by what closely resembles a petiole, is considered by Hooker as the lamina, whose

---

* Sur le developpement des feuilles des *Sarracenia*. 'Comptes Rendus' (lxxi., p. 630.)

† On the Origin and Development of the Pitchers of *Nepenthes*, with an Account of some new Bornean Plants of that Genns. (Trans. Linn. Soc., vol. xxii., p. 415.)

midrib is produced as a tendril-like structure somewhat after the fashion of the cirrhose prolongation of the leaf-apex in *Gloriosa*. The pitcher he views as a glandular excavation on the internal aspect of this "excurrent midrib" somewhat below its extremity.

With regard to this determination a few remarks may not be out of place.

If Hooker's representation of the early development of the leaf of *Nepenthes* be examined, and especially his figure of the first appearance of the pitcher-excavation (*loc. cit.*, Tab. lxxiv., fig. 1 *b*), one cannot but be struck with its exact correspondence with Baillon's description of the development of the *Sarracenia* leaf, where the excavation representing the future pitcher appears as a small fossa a little to the inner side of the cone which represents the young leaf, the base of which is already somewhat dilated and a little concave towards the inner surface. If the pitcher of *Sarracenia* represents a leaf-blade, it seems scarcely possible to resist the conclusion that the same must hold good for *Nepenthes*.

An apparent difficulty, however, arises as to the signification of the flat expansion below the cirrhose support of the pitcher.

At first I was disposed to look upon all the parts below the pitcher—including the flat expansion—as representing the petiole; but an examination of the remarkable leaf-forms occurring in certain *Crotons* now inclines me to adopt a view virtually identical with that of Hooker, although perhaps not exactly in the shape contemplated by him.

In the plants called *Croton interruptus* and *C. picturatus*—probably both of them monstrous forms of *C. angustifolius*—we have, in many of the leaves, the phenomenon of an interruption, or more or less sudden narrowing in the course of the lamina, which for some distance becomes reduced to the slender filamentary midrib. It happens, moreover, that in the greater number of the interrupted leaves the distal portion of the lamina—borne upon the "excurrent midrib"—is developed, peltate-fashion, into an oblique funnel of varying depth.* (Plate 220, figs. 1 and 2).

The closeness of the parallel which may be drawn between this structure and the ascidium-leaf of *Nepenthes* will be at once apparent; and, although analogical reasoning of this kind must be employed with caution, it seems highly probable that in *Nepenthes* we have to deal with a leaf the lamina of which is interrupted in the middle of its course by becoming reduced to its midrib, and that, while the proximal portion of the lamina retains its typical form of a flat expansion, the distal portion becomes peltately expanded into a funnel or pitcher.

In the *Croton* leaves just referred to, it is to be noted that the proximal expansion, while sometimes simply narrowed into the attenuated portion, as in Plate 220, fig. 1, is more frequently developed towards its extremity in a peltate manner, so that the midrib appears as excurrent from the lower leaf-surface, as in Plate 220, fig. 2. This latter case is of special interest inasmuch

* Especially in *C. picturatus*.

as a similar peltation towards the extremity of the proximal expansion occurs in many of the leaves of *Nepenthes phyllamphora*, and forms one of the specific characters of Hooker's magnificent *N. Rajah*.

Explanation of Plates.

Plate 219.—*a* = Leaf-apex. *l* = Pitcher-lid. *ll* = "Lateral line." *mdw* = Middle dorsal wing. *lw* = Lateral wing. *mdt* = Middle dorsal tooth of corrugated rim.

Fig. 1. Normal. Foliage-leaf of *Cephalotus*.

Fig. 2. Specimen A. Leaf with spoon-like excavation on upper leaf-surface.

Fig. 3. Specimen B. Leaf funnel-shaped, with small tooth-like rudiment of pitcher-lid on the near side of the orifice of the funnel.

Fig. 4. Specimen C. Leaf funnel-shaped. Rudiment of pitcher-lid 3-lobed.

Fig. 5. Specimen D. Leaf funnel-shaped. Rudiment of pitcher-lid 2-lobed. Nearly side view.

Fig. 5 (*a*). Nearly dorsal view of same specimen. Middle dorsal wing seen with its tip coincident with the leaf-apex.

Fig. 6. Normal Ascidium-leaf, placed, with petiole nearly vertical, for comparison with the funnel-shaped abnormalities and with the accompanying figure of the petal of *Aconitum*. If the Ascidium-leaf be compared with the funnel-shaped specimens, and the position of the "lateral lines" (*l l*) be noted, it will be evident that the pitcher virtually consists of a calceolate expansion of the far side of the funnel from the main axis.

Fig. 7. Nectariferous petal of *Aconitum* (after Asa Gray), showing petiolar portion (claw) and calceolately pouched lamina.

Plate 220.—Fig. 1. Interrupted leaf of *Croton picturatus*. Distal portion of lamina peltate, forming an oblique funnel. Proximal expansion simply narrowed into the attenuated portion.

Fig. 2. Another of the same. Here, however, the upper part of the proximal expansion is peltate, so that the filamentary midrib appears as "excurrent" from the lower leaf-surface.

In Plate 219 the figures are all more or less magnified. In Plate 220 they are of natural size.

A REVISION OF THE INDIAN SPECIES OF *LEEA*.

By C. B. Clarke, M.A., F.L.S.

(Continued from p. 106.)

Series B. **Viridifloræ.**—Petals greenish white.

Sect. 4. Pycnoneuræ. — Stout shrubs, with several stems. Leaves once or twice pinnate. Leaflets with numerous, close, parallel, primary nerves, conspicuous on the upper surface of the leaflet; secondary nerves close, parallel, pubescent beneath. Serratures of margin 1–2 only for each primary nerve.—In this section are collected three species, easily separated from all the rest, but very difficult to distinguish in the herbarium.

11. L. crispa, Linn. Mant. 124.—Leaves all simply pinnate; petioles and rhachises often winged; leaflets broadly oblong, very parallel-sided, acute or shortly acuminate; ripe berries steel-gray. —Roxb. Fl. Ind. (ed. Wall.), ii. 467; Wall. List, 6827; DC. Prodr.

i. 635; Laws. in Fl. Brit. Ind. i. 655 *partly;* Kurz in Journ. As. Soc. 44, ii. 179; For. Fl. i. 280.—*L. pinnata*, Andr. Bot. Rep. v. t. 355.

Bengal, Assam, Chittagong, Pegu; common in the plains. Less frequent in the hills up to 2500 feet alt. in subtropical valleys.

A stiff shrub, 4–8 feet. There are no bipinnate leaves in the herbarium, nor have I any recollection of such. *Leaflets* 4–7 in., rarely at all caudate, obtuse at the base, subsessile, or some of them with petiolules $\frac{1}{4}$ in. long; primary nerves 12–15, or even 24 on each side the midrib, often carried each to the very point of the marked serratures. *Corymbs* nearly sessile, stout, branches often somewhat winged; nearly glabrous or slightly pubescent; bracts subpersistent, $\frac{1}{4}$–$\frac{1}{3}$ in., linear; bracteoles $\frac{1}{8}$ in., lanceolate. *Petals* green, staminal tube white; lobes shortly bifid, emarginate or mucronate. *Berry* often $\frac{1}{3}$ in. diam., passing from green to a mealy black-blue without going through any yellow stage.—Linnæus says his *L. crispa* was founded on a South African plant which came to him from Herb. Royen. The example now in Linnæus's own herbarium, which came from Herb. Royen, and is named *L. crispa* by Linnæus's hand, is exactly the Bengal plant; but no *Leea* is known from South Africa, and no *Leea* at all near *L. crispa* from Tropical Africa.

12. L. ASPERA, Edgw. in Trans. Linn. Soc. xx. 36.—Upper leaves simply pinnate, or sometimes somewhat bipinnate, petioles and rhachises round or scarcely winged, leaflets cordate elliptic acuminate—Brand. For. Fl. 102; Laws. in Fl. Brit. Ind. i. 665, not of Wall., nor of Kurz. *L. staphylea*, Wall. List. 6824, G and part E, not of Roxb.

North-west Himalaya, alt. 2000–5000 feet, from Kumaon (*Edgeworth*) to Kashmir (*Jacquemont*) frequent; and up to 7000 feet near Dalhousie, *C. B. Clarke*. Chota Nagpore, alt. 2000 feet, frequent; Parasnath, Ranchee, &c., *C. B. Clarke*. Bombay, *Capt. Geturne;* Concan, *Law*. Anamallays, *Wight*, nn. 525, 526.—One of the thoroughly Deccan Plateau forms, extending (as do so many of these) to the Western Himalayan, but not to the Eastern.

A stout, spreading shrub, 6–12 feet high. Uppermost *leaves* usually simply pinnate, or with the lower pinnæ trifoliolate; lower leaves bipinnate. *Leaflets* not parallel-sided; primary nerves carried very nearly (rarely quite) to the edge, then curved sub-bifurcated, so that the crenations of the margin are often nearly twice as many as the primary nerves, and less acute than those of *L. crispa:* upper surface asperous in Edgeworth's type specimen, but the bristles are more often obsolete. *Corymb* bracts, flower and fruit nearly as of *L. crispa*, but the branches are not winged nor so stout. *Berries* black finally; I have no note whether they are yellow when first ripe.—In some of my examples the bracts are nearly an inch long, the bracteoles $\frac{1}{4}$ in. lanceolate-linear somewhat persistent; but they are hardly worth constituting a variety of.—This species must be called *L. aspera*, Edgw., *not* of Wall.; for Wallich's note (in Roxb. Fl. Ind. ed. Wall. ii. 468) probably

means by *L. aspera* the same plant which he has under that name in his herbarium, which is *L. robusta*, Roxb. (see below).

13. L. HERBACEA, Ham. in Wall. List. 6829.—Leaves or many of them bipinnate, leaflets caudate acuminate the base rhomboid or rounded, petioles and rachises rounded or scarcely winged, ripe berries yellow, finally black.—*L. aspera*, Kurz, in Journ. As. Soc. 44, ii. 178, 179, For. Fl. i. 280, not of Wall. *L. crispa*, Laws., in Fl. Brit. Ind. i. 655, in great part.

Himalaya east from Nepal, Khasia, and Birma, alt. 1000–5000 feet, in the lower hills everywhere; the most abundant species of Indian Leea, but not spreading over the plains at any distance from the hills.

A shrub, of many stems 12–16 feet high, bowing in all directions when fully developed; Kurz says sometimes a treelet 10–15 feet, in which state I have not seen it. Except in the less cordate base of the leaflets and the more compound leaves this species does not much differ from *L. aspera*, Edgw., and Kurz was very likely right in uniting it therewith (Kurz, not having Wallich's Herbarium to consult, supposed *L. aspera*, Wall., to be the same as *L. aspera*, Edgw.) The leaflets are particularly free from bristles on the surface, and this was perhaps the reason why Prof. Lawson placed it with *L. crispa*, from which I believe it well distinct. It is frequently burnt down in the jungle-fires of the lower hills, and the shoots from the old roots (unlike the young shoots of the truly arboreous species) frequently flower; it is one of these shoots which Buchanan-Hamilton named *L. herbacea*.

Sect. 5. PAUCIFOLIOLOSÆ. Leaves simple, or 1-pinnate with few large leaflets. Herbs or undershrubs. Primary nerves not close as in the Sect. *Pycnoneuræ*, much fewer than the serrations of the margin.

14. L. MACROPHYLLA, Hornem. Hort. Hafn. i. 231, not of DC.; leaves large cordate ovate simple mealy white beneath from minute clustered pubescence, lobes of the staminal tube entire or slightly emarginate. Roxb. Hort. Beng. 18, Ic. ined. in Herb. Kew. Fl. Ind. ed. Wall. ii. 466; Wall. List. 6818; Wight, Ic. t. 1154; Dalz. & Gibs. Bomb. Fl. 41; Laws. in Fl. Brit. Ind. i. 654, *partly*; Brand. For. Fl. 102; Kurz For. Fl. i. 278, in Journ. As. Soc. 44, ii. 178.—*L. simplicifolia*, Griff. Notul. iv. 697, Ic. Pl. Asiat. t. 645, fig. 1, not of Zoll.

Scattered nearly throughout India, alt. 0–2000 feet; but not abundant anywhere. Terai of the North-west Himalaya, *Falconer*, *Royle*; Sikkim Terai, *C. B. Clarke*; Assam, *Jenkins*; Bengal, near Furidpore, *C. B. Clarke*; Monghyr, *Lockwood*; Chota Nagpore, *C. B. Clarke*. Neelgherries, *Wight*. Mergui, *Griffith*. Frequent in the mixed forests of Pegu and Martaban, fide *Kurz*.

Herbaceous, 1–3 feet high. Lowest leaf sometimes 2 feet diam., upper leaves 6–9 in.; leaves acute, margin toothed often irregularly; primary nerves 8–10 on each side the midrib (in the upper leaves), often some of them 1 in. apart; mealy pubescence of the surface

nearly disappearing with age (as see Wight and Dalzell); petioles often 2–5 in., stipules very large, subpersistent. *Corymbs* sessile, mealy pubescent, large or small. *Berry* $\frac{1}{4}$–$\frac{1}{3}$ in. diam., black, 4–6-celled.—From a note in Herb. Wight, *L. macrophylla*, DC., was *L. sambucina*, Willd.

15. L. LATIFOLIA, Wall. List. 6821; leaves pinnate with 5–3–1 leafllets, leaflets cordate elliptic acute mealy white beneath from minute clustered pubescence, lobes of the staminal tube notched. Kurz For. Fl. i. 278, in Journ. As. Soc. 44, ii. 178.—*L. macrophylla*, Laws., in Fl. Brit. Ind. i. 664, partly, not of Hornem. *L. cinerea* and *coriacea*, Laws., in Fl. Brit. Ind. i. 665.

Prome, *Wallich*. Concan, *Stocks;* Malabar, Palghat, *Wight*.

Leaflets usually 3–5, the upper sessile, the lower shortly stalked; simple leaves would appear rare, but all the material at London and Calcutta does not amount to much. This plant has every appearance of being the full form of *L. macrophylla*, and I suspect Prof. Lawson was right when he united it therewith. Kurz has attempted to separate *L. latifolia* by the deeper notching of the lobes of its staminal tube, but I can make nothing definite out of that character. The distribution of the two species at once suggests that one is merely a form of the other. *L. coriacea*, Laws., is merely the fruiting state of *L. cinerea*, Laws.; the difference in the mealy indumentum of the two (each founded on a single fragment) being exactly that seen in the pubescence of flowering and fruiting examples of *L. macrophylla;* nor is there any difference in the toothing of the margin of the two. Prof. Lawson called the 3-foliolate examples of *L. latifolia* (in Herb. Wallich) *L. macrophylla*, Roxb., and he placed the species of *L. latifolia* with *L. macrophylla* rather than with his *L. cinerea* and *coriacea* at the same time that he diagnosed *L. macrophylla* as having simple leaves. But the whole set is perhaps but one species.

16, L. GRANDIFOLIA, Kurz in Journ. Bot. 1875, 325; glabrous, leaflets 3–5 petiolulate coriaceous ovate-oblong acute very large, corymbs stout short-peduncled.

Nicobars, Katchall, *Kurz*. Distrib. "Tace and Trick," fide *Kurz* in Journ. As. Soc. 45. ii. 124.

A treelet, 8–20 feet high. *Leaflets* 11 by $4\frac{1}{2}$ in.; primary nerves 12 on each side the midrib $\frac{3}{4}$ in. apart, crenations very shallow or irregular, often 2 or more for each primary nerve; petiolules $\frac{3}{4}$ in. *Peduncle* 1 in. stout; corymb 4 in. diam.; bracts and bracteoles early deciduous; flowers rather larger than in the preceding species. *Berry* (ex Kurz) size of a large pea, lead-coloured, 6–3-celled.—Description copied mainly from Kurz, who has communicated an example to Kew which shows it to be a fine new species.

Sect. 6. SAMBUCINÆ. Leaves 2–3-pinnate, glabrous or very nearly so; primary nerves not very close and parallel as in Sect. *Pycnoneuræ*. Trees and shrubs.

17. L. COMPACTIFLORA, Kurz in Journ. As. Soc. 42, ii. 65; 44,

ii. 179; For. Fl. i. 279.—Treelet, all parts glabrous or the cyme rusty tomentose glabrescent, leaves bipinnate, flowers small greenish white sessile between broad short scaly bracts.

Martaban Hills, in the moister forests east of Tounghoo, alt. 3000–4000 feet, *Kurz*.

Height, 12-15 feet. Petioles long, terete; leaflets 4–6 in., linear to oblong-lanceolate long-acuminate, blunt at the base, serrate, chartaceous; petiolules $\frac{1}{6}$—$\frac{1}{4}$ in. sharply 4-angled. *Cymes* corymbose, shorter than the petiole, flowers in small clusters.

The foregoing is copied from Kurz. There is no authenticated example of this species in London, but from the strongly-marked characters I identify with it a fruiting example of Griffith's, from which the following additional particulars are taken:—

Petiole $5\frac{1}{2}$ in.; stipules $2\frac{3}{4}$ in., subpersistent. Leaflets glabrous; primary nerves sixteen on each side the midrib, not more than $\frac{1}{3}$ in. apart, parallel, carried not quite to the margin, serratures somewhat sharp, 2–5 for each primary nerve; secondary nerves close, parallel, conspicuous. *Peduncle* $\frac{1}{2}$ in. *Corymb* (in fruit) 4–5 in. diam., bracteoles ovate, acute, $\frac{1}{4}$–$\frac{1}{3}$ by $\frac{1}{6}$ in., persistent (some of them) among the ripe fruits; pedicels nearly glabrous. *Berries* $\frac{1}{3}$ in. diam., pyrenes 6–4.—The leaflets and their venation are at first sight much like those of *L. herbacea*, Ham.; but their serration, their glabrousness, and the bracts to the corymb are quite different. The plant is perhaps really allied to *L. bracteata*, but it is glabrous, and the venation is totally different.

Naga Hills, *Griffith* (Herb. Propr. n. 1297. From the date on Griffith's original ticket it appears that this plant was collected in the true Mishmee country.

18. L. PARALLELA, Wall. List. 6828.—Shrubby, leaves 2-pinnate or the uppermost 1-pinnate, leaflets elongate-oblong acuminate, primary nerves very oblique, peduncles or primary corymb-rays very long. Laws. in Fl. Brit. Ind. i. 666; Kurz in Journ. As. Soc. 44, ii. 178; For. Fl. i. 278.—*L. angustifolia*, Laws. in Fl. Brit. Ind. i. 666.

Burma, *Wallich;* Rangoon, *M'Lelland;* Assam, *Masters*. Bengal (? Assam), Jenkins.

Leaflets 9 by $1\frac{3}{4}$ in., rhomboid at base, chartaceous, glaucous above; primary nerves 12 on each side the midrib, $\frac{1}{3}$ in. apart, sloping and curving much towards the apex of the leaf; secondary nerves close, parallel, distinct; margin shallowly toothed; petiolules very short. *Panicle* lax, 8 in. diam.; glabrous, the pedicels minutely puberulo-pubescent. *Flowers* and berries nearly as in *L. sambucina*.

19. L. SAMBUCINA, Willd. Sp. Pl. i. 1177.—Shrubby, leaves bi- or tri-pinnate, leaflets elliptic acuminate crenate glabrous not setulose on the nerves beneath, corymbs subsessile rigid, somewhat dense glabrous or only most minutely pubescent upwards, buds longish, petals green, staminal tube yellow-white, the lobes distinctly notched, berry black. Roxb. Hort. Beng. 18, Fl. Ind. ed.

Wall. ii. 470; DC. Prodr. i. 633; Wall. List. 6823, a, C, part B; Blume, Bijd. 196; Griff. Notul. iv. 698, Ic. Pl. Asiat. t. 644, fig. 1, t. 645, fig. 6, 8; Decne in Ann. Mus. d' Hist. Nat. iii. 445; Miq. Fl. Ind. Bat. i. pt. ii. 611, in Ann. Mus. Lugd. Bat. i. 98, only in part, and perhaps not at all; Laws. in Fl. Brit. Ind. i. 666, partly; Brand. For. Fl. 102; Kurz. in Journ. As. Soc. 44, ii. 179, For. Fl. i. 279; not of Benth., nor of Baker.—*L. Staphylea*, Roxb. Hort. Beng. 18, Fl. Ind. ed. Wall. ii. 471; Wall. List. 6824, F, I; W. & A. Prodr. 132; Wight, Ic. t. 78; Dalz. & Gibs. Bomb. Fl. 41; Thwaites Enum. Pl. Zeyl. 64.—*L. Ottilis*, DC. Prodr. i. 636.—*Leea viridiflora*, Planch. Hort. Donat. 6.—*Aquilicia Sambucina*, Linn. Mant. 211; Cav. Dissert. vii. t. 218, optime.—*Staphylea indica*, Burm. Fl. Ind. 75, t. 24, fig. 2. *Aquilicia Ottilis*, Gaertn. Fruct. i. 275.—*Ottilis Zeylanica*, Gaertn. Fruct. t. 57.—*Gastonia Naluga*, Lamk. Dict. ii. 611.—*Gilibertia Naluga*, DC. Prodr. iv. 256.—Rumph. Herb. Amb. iv. t. 45. Rheede Hort. Mal. ii. t. 26.

India; from Gurwhal and Assam to Ceylon and Singapore; abundant in the plains of Bengal, and ascending the hills to 4000 feet. But the Ceylon and Malabar examples belong nearly all of them to the variety called *occidentalis* below. — Distrib. Malaya (scarce). No example at Kew from Australia, Africa, or its islands.

A stiff, branching shrub, 4–10 feet high. Kurz says that in Burma it is sometimes a treelet 15–20 feet high; I have never seen it with anything like a trunk. *Leaflets* 4 by 2½ in., rhomboid or rounded at the base; primary nerves 12 on each side the midrib ⅓ in. apart, curving much near the margin of the leaf, crenatures (rarely acute or subserrate) 1–3 to each primary nerve; secondary nerves less distinct than in most species; petiolules ⅛–¼ in.; stipules caducous. *Corymbs* 3–6 in. diam.; bracts and bracteoles inconspicuous, early deciduous. *Berry* ¼–⅓ in. diam.; pyrenes 4–6.—Some of the Malay Peninsula examples have very large leaflets, or very stout corymbs. The species appears to become rare towards Malacca, and to be very scarce in Malaya. Miquel attributes to his *L. sambucina* red berries; it could, therefore, not have been the Bengal *sambucina*. The Malay "*sambucina*" is nearly all of it red-petalled, is the same as the Australian *sambucina* of Bentham, and belongs to Series *Rubrifloræ*. The Madagascar *sambucina* and the tropical African *sambucina* also have red petals.

Var. *occidentalis*.—Corymb-branches stout, buds much shorter and broader than those of the Bengal *sambucina*.—This appears to be the common Malabar form, from the Concan to Ceylon; here belong Wall. List. 6824, A, B, D, H. It would appear from the plants of Roxburgh found in Wallich's Herbarium that Roxburgh considered the Bengal and Malayan plant to be *L. sambucina*, the Malabar plant *L. Staphylea*; but his two Ic. Ined. preserved at Kew do not agree well with this theory. I do not know this var. *occidentalis* alive; it is a form not found eastwards; I cannot, therefore, hazard any opinion regarding its specific separability.

20. L. GIGANTEA, Griff. Notul. iv. 697, Ic. Pl. Asiat. t. 645, fig. 3, not of Kurz.—Shrubby, with a single trunk, glabrous, leaves

2–3-pinnate, leaflets large, corymbs in fruit half a yard in diam. lax, petals green rubescent towards the base, lobes of the staminal tube conic-subulate, berry black, seeds grooved without tubercles. *L. sambucina*, Wall. List. 6823, B. (chiefly).—*L. Staphylea*, Wall. List. 6824, K.

Malay Peninsula, from Moulmein southwards, and in Penang; *Wallich, Griffith.*

Wallich has noted "large tree" on his specimens. This species resembles much the large forms of *L. sambucina*, but the lobes of the staminal tube are acute entire. The seeds, which I have examined in all the available examples of Griffith and Wallich, are exactly as those of *L. sambucina*. The leaflets are sometimes as much as 11 by 3½ in.

21. L. TUBERCULOSEMEN, C. B. Clarke.—As *L. gigantea*, but the "seeds tubercled-keeled, the edges tubercled-ribbed." *L. gigantea*, Kurz in Journ. As. Soc. 42, ii. 65; 44, ii. 178—179; For. Fl. i. 280, not of Griff.

From Moulmein to Tavoy, apparently frequent, *Kurz*.

I have given this most obscure species a horrible name, as no other *Leea* has troubled me so much. The seeds of all my Leeas, which I had supposed *L. gigantea*, have a τ-shaped groove down the back, instead of a tubercled keel; and therefore both Kurz and Dr. King have always told me that I was mistaken about *L. gigantea*, Griff. I now find that, in all Griffith's material and in all his pictures, there is but one form of seed which is tubercled neither on the keel nor on the sides. I have sometimes imagined that by a slip it was meant that the pyrenes were tubercled on the keel and sides. Such an imagination can hardly be hazarded with regard to two such botanists as Kurz and King; and, moreover, the pyrenes in Griffith's *gigantea* are not tubercled on the keel and sides; they are somewhat rugged, just as in other species. The present species must be left for future extrication.

22. L. UMBRACULIFERA, C. B. Clarke.—Tree, glabrous, leaves 2–3-pinnate, leaflets (not large) narrow lanceolate acuminate caudate, corymb very large lax 2–3 feet wide in fruit, petals green, staminal tube white lobes bifid, otherwise as *L. sambucina*.—*L. acuminata*, Herb. Kew, not of Wall.

Sikkim, Bhotan, Khasia, alt. 1000–2000 feet, frequent; *J. D. Hooker, Wallich, Booth, Masters, Jenkins, C. B. Clarke.*

A tree, with a trunk as thick as a man's body, often 20 feet to the first branch, and attaining sometimes 50 feet in total height. Leaflets very narrow and caudate, so far resembling *L. acuminata*, Wall. The duplicate example of *L. acuminata* communicated from Herb. Wallich to Kew is without flowers or fruits, but I feel pretty sure it is *L. umbraculifera*; and by matching with it, all the Kew *L. umbraculifera* has got named *L. acuminata*, Wall. This is that *L. acuminata*, Wall., which Lawson has sunk in *L. sambucina*, and I am not sure that he is wrong in so doing. There are many trees which are shrubby in the plains of Bengal, but which appear as large trees, with considerable leaf-differences, in the hills. *L.*

umbraculifera does not differ from *L. sambucina* either in its flowers or fruits; it is separated by its very large size, narrow caudate leaflets, and very spreading panicle.

23. L. INTEGRIFOLIA, Roxb. Fl. Ind. ed. Wall. ii. 472.—Glabrous, leaves 3-pinnate, leaflets lanceolate caudate entire or sometimes very slightly serrate, corymb peduncled large, flowers and fruits as in *L. sambucina*. W. & A. Prodr. 132; Laws. in Fl. Brit. Ind. i. 667.

Circars; in moist valleys, *Roxburgh*.

This was either an accidental variety of *L. sambucina* with unusually entire leaflets, or it must have been a species that no one but Roxburgh has ever seen. The excellent Ic. Ined. of Roxburgh shows the flowers and fruits; and represents either a highly developed form of *L. sambucina* or a species very close thereto.

24. L. MASTERSII, C. B. Clarke.—Glabrous, leaves bipinnate, leaflets elliptic acuminate setulose on the nerves beneath, corymb large lax in fruit nearly glabrous.

Assam, *Masters*, n. 400.

Leaflets $4\frac{3}{4}$ by 3 in., minutely setulose on the upper surface; primary nerves 12 on each side the midrib, serratures 2–3 for each primary nerve; secondary nerves reticulated, only obscurely parallel. *Berries* 2–4-seeded.—I cannot guess from the buds whether the petals were red; they may have been, and the leaves resemble somewhat those of *L. rubra*. This is a very puzzling specimen; it was in Herb. Bentham, and there named *L. robusta*, Roxb., and has since been named by Lawson *L. aspera*, Wall. It may be near *L. sambucina* or *L. lata*, but, so far as I can judge, not near *L. robusta* or *L. aspera*.

(To be continued.)

GENERIS *ASARI* SPECIEM NOVAM

OFFERT H. F. HANCE.

348 ASARUM CAUDIGERUM, sp. nov.—Foliis binis oppositis carnosulis flaccidis supra obscure lucidis præter nervos pilis raris consitos glaberrimis subtus opacis pallidioribus puberulis petiolo laminæ tripollicari cordato-reniformi acutæ sinu basali lato lobis divergentibus æquilongo, flore nutante pedunculo glanduloso-piloso longiore, perigonii luridi glanduloso-puberi carnosuli sesquipollicaris tubo campanulato fauce non constricto intus haud nervoso limbi lobis subovato-lanceolatis medio leviter constrictis apice in acumen filiforme iis æquilongum productis, antheris processu parvo globoso coronatis, stylis 6 in. columnam cavam stamina adæquantem fere ad apicem usque coalitis, stigmatibus terminalibus recurvis, ovario subinfero.

In prov. Cantonensi, secus fl. East River, coll. Dr. C. Gerlach, m. Novembri, 1880. (Herb. propr. n. 21366.)

Species insignis, a propinquis *A. caulescenti*, Maxim. !, *A. himalaico*, Hook. fil., et præcipue, ut videtur, *A. Hookeri*, Field. & Gardn., variis notis, imprimis antherarum appendicis forma, perigoniique lobis longissime filiformi-caudatis optime distincta.

NOTES ON SHROPSHIRE PLANTS.

By William E. Beckwith.

(Concluded from p. 46.)

Digitalis purpurea, L. I have found the white variety about the Wrekin, and near Condover, for several years in succession.

Linaria Cymbalaria, Mill. Old walls in towns very frequent; near Cound I have found it on ditch banks.

L. Elatine, Mill. Very frequent in ploughed fields under the Wrekin; I have also found it, near Charlton Hill, Berrington, Pitchford, and Almond Park, usually growing on stiff clay soils.

Limosella aquatica, L. In a pool on Charlton Hill, Wroxeter.

Veronica polita, Fries. Corn-fields, often very plentiful.

V. Buxbaumii, Ten. In 1877 I found several plants of this *Veronica* near Eaton Constantine, but I have never seen it since.

V. montana, L. Very frequent in woods about the Wrekin and on Wenlock Edge.

V. scutellata, L. Pools near Berrington; near the reservoir under the Wrekin; boggy ground on the Longmynds; near Ellesmere Mere.

V. Anagallis, L. Frequent on the banks of the Tern, and in ditches near Eyton-on-the-Wealdmoors; occurs also near Shifnal, Hawkstone, Wroxeter, Eaton Constantine, and Cressage.

Pedicularis palustris, L. Boggy ground near the Wrekin, on the Longmynds, and by Colemere Mere.

Melampyrum pratense, L. Very frequent in woods round the Wrekin.

Lathræa Squamaria, L. Mr. R. M. Sergeantson has obtained this species by a brook on Cound Moor.

Orobanche rapum, Thuill. On broom near Brockholes Bank, Leighton; near Acton Burnell.

O. minor, L. In the summer of 1880 I found this species, growing plentifully, in a field of red clover between Berrington and Cound.

Verbena officinalis, L. Near Shineton; Spoul Lane, Leighton; Harnage, Cound, Buildwas, Berrington, and Attingham.

Lycopus europæus, L. Pool near Eaton Constantine; very frequent about Berrington, Bomere Pool, and Ellesmere.

Mentha viridis, L. Right bank of the Severn, below Coalport.

M. piperita, Huds. Near Cantlop Cross, Berrington.

M. sativa, L. Boggy ground near Eaton Mascott.

Thymus Serpyllum, L. Very plentiful about Much Wenlock and Ludlow; occurs also on Charlton Hill and the Longmynds.

Origanum vulgare, L. Brockholes Bank near Leighton, and near Moel-y-golfa Hill, just on the borders of Shropshire. Mr. R. M. Sergeantson has also brought me specimens from Frodesley.

Calamintha Clinopodium, Spenn. Very frequent in woods and hedges about the Wrekin.

C. Acinos, Clairv. Frequent about Much Wenlock; near Whitemere Mere.

C. menthifolia, Host. Near Bridgnorth and Uffington.

Salvia Verbenaca, L. Rather frequent about Bridgnorth; near Harnage, Cound.

Scutellaria galericulata, L. Frequent near Leighton, Eaton Mascott, Berrington, Ellesmere, and along the banks of the Shropshire Union Canal.

S. minor, L. Mr. R. M. Sergeantson has found this species near the Caradoc Hill and Frodesley.

Marrubium vulgare, L. On Charlton Hill, but probably an escape from a garden.

Stachys Betonica, Benth. Very abundant in fields near the Wrekin, Charlton Hill, and Cressage Park.

Galeopsis angustifolia, Ehrh. Rather frequent about Much and Little Wenlock, and round the base of the Wrekin.

G. versicolor, Curt. Near Berrington, Bomere, and Dryton Wroxeter.

Lamium amplexicaule, L. Near Dryton Wroxeter.

L. album, L. Frequent near villages; very common in the parish of Wroxeter.

L. Galeobdolon, Crantz. Moist woods about the Wrekin, Leighton, Buildwas, and Cound, very frequent.

Teucrium Chamædrys, L. I had a specimen of this plant, sent me by Mr. W. Phillips, in 1877, from near Bridgnorth.

Echium vulgare, L. Fields and hedges near Cound and Much Wenlock; a variety with pink flowers growing near the latter place. In the summer of 1878 this species was most abundant, in a clover-field between Upton Magna and Withington, probably brought in impure clover-seed.

Lithospermum officinale, L. Woods between Cound and Evenwood; banks of the Severn near Buildwas; woods in Farley Dingle, about Tickwood Hall, and near Coalport; hedges near Blackmere Mere, Ellesmere.

L. arvensis, L. Near Garmston, Leighton; and Hardwick near Ellesmere.

Myosotis collina, Reich. Charlton Hill and Tentree Hill, Wroxeter; Arkoll Hill; High Rock, near Bridgnorth.

M. versicolor, Reich. Frequent on high ground, especially about the Wrekin, Much Wenlock, Bridgnorth, and Church Stretton.

Anchusa arvensis, Bieb. Fields about Wroxeter, Cound, Much Wenlock, Bridgnorth, and Grinshill, frequent.

A. sempervirens, L. In 1878 I found this plant growing luxuriantly near the Leopard Inn, Broseley, a locality given by Mr. W. P. Brookes in Leighton's 'Flora.'

Symphytum officinale, L. Very frequent about Shifnal; occurs also along the banks of the Tern, and near Leighton, and Cound.

Cynoglossum officinale, L. By the Shropshire Union Canal, near Ellesmere, and Bettisfield. In Attingham Park, and near Cound, Much Wenlock, Bridgnorth, and Berrington.

Pinguicula vulgaris, L. Very frequent on the Longmynds; a few plants also grow in a boggy field at the south-west base of the Wrekin.

Utricularia minor, L. Very frequent in a deep ditch, running parallel with the Cambrian Railway, about the middle of Whixall Moss.

Hottonia palustris, L. Frequent near Cound, Berrington, Bomere, Wroxeter, and Attingham; abundant in ditches near Oteley, and Blackmere, Ellesmere.

Primula vulgaris, Huds. In 1878 I found a variety, with dark sulphur-coloured flowers, in the Devil's Dingle, Buildwas.

P. officinali-vulgaris, Syme. Not unfrequent in woods near Spout Lane, Leighton, and between Little Wenlock and Buildwas.

Lysimachia vulgaris, L. Bogs near Coalport, Leighton, Cound, and Eaton Mascott. By Berrington and Almond Pools; very frequent about the Ellesmere Meres, especially Colemere and Whitemere.

L. Nummularia, L. Abundant about Coalport; frequent near Buildwas, Shineton, Harley, Cressage, Leighton, Berrington, and Ellesmere.

Anagallis arvensis, L. The variety *cærulea* of this species has grown for several years in some fields south of Eaton Constantine village.

A. tenella, L. Very frequent on the Longmynds; occurs also on Tentree Hill, and in boggy ground under the Wrekin.

Plantago media, L. Abundant about Much Wenlock and Buildwas; frequent near Craven Arms.

P. Coronopus, L. Rocks on Charlton Hill, Wroxeter.

Scleranthus annuus, L. Near Acton Burnell, on Charlton Hill, and Tentree Hill, Wroxeter, on the Cambrian Railway, over Whixall Moss.

Chenopodium Bonus-Henricus, L. Wenlock Abbey; near Buildwas, Cound, Berrington, Stokesay, and Ludlow.

Rumex maritimus, L. By Ellesmere Mere. Field near Acton Burnell. Plentiful in a bog between Eaton Mascott and Cound.

R. Hydrolapathum, Huds. Tern river. Pools near Tong Shifnal. By Colemere Mere.

Polygonum Bistorta, L. Near Eaton Constantine; White Ladies and Boscobel, Shifnal; Shelton Rough, Shrewsbury; and Fapley. Very frequent by the River Worfe, near Rindleford; and near Ellesmere.

Daphne Laureola, L, Frequent near Much Wenlock, Buildwas, and Little Wenlock. I have also found it at Harley; and Mr. R. M. Sergeantson near Acton Burnell.

Empetrum nigrum, L. Frequent on Welshampton Moss.

Euphorbia amygdaloides, L. Abundant about Much Wenlock; and Shinewood, Shineton; frequent near Ludlow, Craven Arms, Almond Park, and Buildwas.

E. exigua, L. Cultivated fields near Little Wenlock, Leighton, Buildwas, Harley, and Eaton Constantine, frequent.

Callitriche pedunculata, DC. Pools and ditches about Charlton Hill, Eyton-on-Severn, Leighton, Cound, and Berrington, frequent.

Ceratophyllum demersum, L. Rather frequent in Ellesmere Mere, more rarely in Whitemere Mere.

Parietaria diffusa, Koch. Wenlock, Buildwas, and Haughmond Abbeys. Rocks and walls in Bridgnorth, Ludlow, Oswestry, and Moreton Corbet.

Humulus Lupulus, L. Hedges very frequent, and certainly quite wild.

Carpinus Betulus, L. Frequent at the base of the Wrekin, above Wenlock Wood.

Myrica Gale, L. Boggy ground near Lee, Croesmere and Blackmere Meres, Ellesmere.

Populus alba, L. Near Buildwas, Cound, and Attingham Hall.

P. tremula, L. On the banks of the Severn near Buildwas.

Salix pentandra, L. In a small wet wood near Whitemere Mere.

Taxus baccata, L. Several very fine trees on the sides of the Wrekin, and one very large one in Acton Burnell Park.

Typha latifolia, L. Frequent about Ellesmere, Leighton, and Willey; Hencott and Almond pools; River Tern at Attingham.

T. angustifolia, L. Hencott pool. Pool near Berwick Hall, Berrington, and Bomere pools.

Sparganium simplex, Huds. Acton Burnell park; near Eaton Constantine, Eyton-on-the-Wealdmoors, and Blackmere Mere.

S. minimum, Fries. Pool near Eaton Constantine.

Acorus Calamus, L. Pools at Tong, near Shifnal.

Lemna trisulca, L. Pools near Eaton Constantine and Berrington. In Ellesmere and Whitemere Meres.

Potamogeton rufescens, Schrad. In the Shropshire Union Canal, between Blackmere and Colemere Meres.

P. heterophyllus, Schreb. Frequent in Berrington Pool.

P. perfoliatus, L. Frequent in the Shropshire Union Canal and Betton Pool, near Berrington.

P. crispus, L. Pool near Leighton Mill. Pool near Buildwas Abbey.

P. pusillus, L. Shropshire Union Canal, near Bettisfield.

P. pectinatus, L. Shropshire Union Canal, near Upton Magna, and Eyton-on-the-Wealdmoors abundant. Pools near Smethcott, Wroxeter.

Triglochin palustre, L. Near Eaton Constantine, Belswardyne Hall, Leighton, Tentree Hill, Charlton Hill; Ellesmere, Colemere, and Whitemere Meres.

Sagittaria sagittifolia, L. In the Shropshire Union Canal near Upton Magna, and Uffington; in Sundorne Pool, Tern River, and ditches on the Wealdmoors near Eyton.

Alisma ranunculoides, L. Berrington Pool, Ellesmere and Whitemere Meres.

A. natans, L. In 1880 I found this species abundant in the Shropshire Union Canal, near Colemere Mere, and Upton Magna. I also obtained specimens from Ellesmere, Whitemere, and Newton Meres.

Butomus umbellatus, L. In the Severn, near Leighton; in Acton Burnell Park; the pool at Sundorne, and canal at Uffington.

Hydrocharis Morsus-rana, L. Abundant in ditches on the Wealdmoors, near Eyton.

Elodea canadensis, Rich. Abundant in the Shropshire Union Canal, the Ellesmere Meres, and pools near Berrington, Acton Burnell, Leighton, Eaton Constantine, and Wroxeter. During the last few years this plant has spread most remarkably through many parts of Shropshire; fragment of it must, I think, be transported by wildfowl, as it often occurs in small pools entirely fed by springs, and unconnected with any stream.

Orchis pyramidalis, L. Very frequent about Much Wenlock, Buildwas, and the Arkoll Hill.

O. Morio, L. Frequent near Buildwas, Leighton, Eaton Constantine, Wroxeter, Harley, and Shineton.

O. incarnata, L. In the summer of 1880 Mr. W. Phillips and I found this Orchis in an open wood near Colemere Mere.

Gymnadenia conopsea, R. Br. Near Spout Lane, Leighton, and in Farley Dingle. Mr. R. M. Sergeantson has also gathered it near Church Preen.

Habenaria viridis, R. Br. Fields at Longwood; Eaton Constantine; and Spout Lane, Leighton.

H. chlorantha, Bab. Woods near Much Wenlock, Farley, Buildwas, Leighton, the Arkoll Hill, Cound, Craven Arms, and Whitemere.

Ophrys apifera, Huds. Fields round Much Wenlock, in Farley Dingle (where it grows in open places in woods), and between Buildwas and Little Wenlock.

Spiranthes autumnalis, Rich. Fields on Charlton Hill; near Little Wenlock, and at the base of Tentree Hill.

Listera ovata, R. Br. Damp woods and in fields about the base of the Wrekin, and round the Arkoll Hill; near Little Wenlock, Buildwas, Much Wenlock, Eaton Constantine, and Ellesmere.

Epipactis latifolia, All. Woods near the Wrekin, Condover, Bomere, Sundorne, and Ludlow.

E. palustris, Crantz. Mr. R. M. Sergeantson has found this plant in a bog near Church Preen.

Crocus nudiflorus, Sm. In fields in the Quarry, Shrewsbury, where it has grown for many years.

Narcissus Pseudo-narcissus, L. Fields about Leighton. Near Cound, and on Cound Moor.

N. poeticus, L. Quite naturalised in a field near Cound Lane, where it has grown for forty years at least.

Galanthus nivalis, L. Woods near Cound, Leighton, and Colemere Mere.

Tamus communis, L. Hedges very frequent.

Paris quadrifolia, L. Woods in Farley Dingle, wet boggy wood near Leighton, wood near the Caradoc Hill.

Convallaria majalis, L. Woods near Cound, Buildwas, and Colemere Mere.

Scilla nutans, Sm. A variety with white flowers is frequent in Acton Burnell Park, and about the Wrekin.

Allium vineale, L. Near Acton Pigott. The variety *compactum* grows in two places near Berrington, and near Leighton.

A. oleraceum, L. By the road leading from Cressage to Cound Moor.

A. ursinum, L. By streams flowing from the Wrekin, by Cound and Shineton brooks, often growing in large masses.

Narthecium Ossifragum, Huds. Shomere Moss, near Bomere Pool, Whixall Moss, Welshampton Moss.

Colchicum autumnale, L. Fields near Bridgnorth, Much Wenlock, Craven Arms, Buildwas, Harley, Acton Pigott, Shineton, Berrington, Little Wenlock, and Charlton Hill.

Luzula sylvatica, Bich. Woods near Ironbridge, Coalbrookdale, and Ludlow, most abundant.

Juncus obtusiflorus, Ehrh. Canal banks near Berwick Wharf.

Rhynchospora alba, Vahl. Shomere Moss, Whixall and Welshampton Mosses.

Blysmus compressus, Panz. Mr. R. M. Sergeantson obtained specimens from Church Preen in 1878.

Scirpus acicularis, L. Sides of Ellesmere Mere.

S. palustris, L. Abundant in pools on the Longmynds, near Church Stretton.

S. setaceus, L. Mr. R. M. Sergeantson has found specimens near Acton Burnell, and it is very frequent round the base of the Wrekin, and near Ellesmere.

S. lacustris, L. Tern River; pools in Willey and Acton Burnell Parks, Almond Pool, Colemere and Whitemere Meres.

S. sylvaticus, L. By Tern River; round Sundorne Pool, and in ditches near Coalport, very frequent.

Eriophorum vaginatum, L. Very abundant on Whixall Moss. I have also found it near Welshampton, Berrington, and on mosses near Bomere Pool.

E. angustifolium, Roth. Whixall Moss, very abundant; bogs near Bomere Pool, Berrington, Leighton, and Tentree Hill.

Carex pulicaris, L. Bog at the south-west base of the Wrekin; boggy ground on the Longmynds, and near Ellesmere Mere.

C. paniculata, L. Near Tong; Fenn's Bank, Whitchurch; and Colemere Mere.

C. vulpina, L. Frequent in ditches and wet places, especially near Leighton, Ironbridge, Coalport, Uckington, Cound, Berrington, Acton Burnell, and Ellesmere.

C. muricata, L. Dry banks frequent, especially about Eaton Constantine, Berrington, Cound, and Ellesmere.

C. stellulata, Good. Near Garmston, Leighton; Berrington, Ellesmere, and on the Longmynds, frequent.

C. remota, L. Frequent near Leighton; the White Ladies, Shifnal; the Wrekin, Buildwas, and Ellesmere.

C. elongata, L. In 1880 I found several examples of this species near Whitemere Mere, some of which I forwarded to Professor Oliver, who most kindly identified them.

C. curta, Good. Near the Cambrian Railway on Whixall Moss. Frequent on Welshampton Moss.

C. ovalis, Good. Frequent near Eaton Constantine, Leighton, the Wrekin, Berrington, Belswardyne, Buildwas, and Sundorne.

C. vulgaris, Fries. Frequent about the reservoir near Wellington, Cound, Berrington, Bomere Pool, and Ellesmere.

C. glauca, Scop. Wet fields, very common. In 1880 Mr. R. M. Sergeantson showed me specimens nearly three feet high, which were afterwards identified by Mr. Carruthers.

C. pallescens, L. Bogs at the south-west base of the Wrekin; below Charlton Hill, and near Leighton Mill.

C. pendula, Huds. Frequent near Leighton and Buildwas. I have also found it near Shineton, Coalbrookdale, Ironbridge, and Coalport.

C. sylvatica, Huds. Frequent near Buildwas, Leighton, the Wrekin, Eaton Constantine, and Acton Burnell.

C. binervis, Sm. Mr. R. M. Sergeantson sent me specimens of this from near the Caradoc Hill, and the Longmynds, in 1880.

C. fulva, Good. Bog at the south-west base of the Wrekin; Mr. R. M. Sergeantson has also found it near the Caradoc.

[I have very carefully searched two localities, given in Leighton's 'Flora,' for *C. distans*, viz., "moist meadows about Eaton Mascott" and "under the Wrekin," but without success.]

C. flava, L. Near the Caradoc Hill, Berrington, the Wrekin, Arkoll Hill, Ellesmere, and on the Longmynds, frequent.

C. filiformis, L. By Berrington Pool, and Colemere Mere.

C. hirta, L. Very frequent in wet boggy places in fields; one of the most common Carices in Shropshire.

C. Pseudocyperus, L. By the side of the Shropshire Union Canal; and about Ellesmere and Colemere Meres, very frequent; it also occurs near Acton Burnell, Condover, Cound, Eaton Constantine, Willey; and Smethcott, Wroxeter.

C. rostrata, Stokes (*C. ampullacea*, Good.) Near Tong; Ellesmere, Colemere, and Whitemere Meres; Cound, and Berrington.

C. vesicaria, L. Pools near Berrington, Cound, Leighton, and Ellesmere, very frequent.

Phragmites communis, Trin. Abundant by Almond and Hencott Pools, and by Colemere and Croesmere Meres.

Milium effusum, L. Woods near Buildwas, and about the Arkoll Hill.

Melica uniflora, Retz. Very frequent near Leighton. Near Sundorne Castle.

Glyceria fluitans, R. Br. Very common in the neighbourhood of Ellesmere, and along the banks of the Shropshire Union Canal.

G. aquatica, Sm. By the Severn below Buildwas Bridge; by the Tern; near Upton Magna; near Uffington, Eyton-on-the Wealdmoors, and Colemere Mere.

I am indebted to Colonel Cooke, Director of the Ordnance Survey, for the following heights and areas of mountains and meres in Shropshire:—Feet above mean level of the sea at Liverpool: Brown Clee Hill, 1788; Titterstone Clee, 1754; Longmynds, 1342; Wrekin, 1342. Acres: Ellesmere Mere, 115; Colemere Mere, 71: Whitemere Mere, 64; Croesmere Mere, 38; Newton Mere, 21; Blackmere Mere, 20.

ON A NEW CHINESE *SENECIO*.

By Henry Fletcher Hance, Ph.D., F.L.S., etc.

The enormous extent of the genus *Senecio*, which now comprises upwards of 1000 species, would probably have made me hesitate to describe as new a Chinese species in my herbarium, had not those of India and the extreme east of Asia and Japan been recently most carefully and thoroughly reviewed, the former by Mr. C. B. Clarke,* the latter by my friend M. Maximowicz,† and by Messrs. Franchet and Savatier.‡ The plant of which I subjoin a diagnosis, drawn up from a careful examination of living specimens, sprung from the rhizomes originally collected, is a very distinct, and, I may add, somewhat remarkable one, on account of its unusually convex receptacle and the entire absence of pappus; but I have not the slightest hesitation in regarding it as a genuine *Senecio*, belonging to the section *Ligularia*, a quite natural group, though one not readily defined by verbal characters. In the normal species of *Ligularia* the pappus is as long as, and frequently considerably exceeds, the achene;§ but in one occurring in Poland and the Carpathians,‖ separated generically by many authors, under the name of *Senecillis*, and only known to me by Gaertner's analytical figures,¶ the pappus is reduced to a few very short paleiform bristles, united at the base into a ring. There is a second Kashmir species, which usually has a similar pappus, but, according to Maximowicz,** it is sometimes rather elongated, and this is also habitually the case in a third, from Manchuria and Japan, founded by himself;†† whilst, according to Mr. Bentham,‡‡ in the original species it is sometimes altogether deficient. Hence, the decision of the last-named author, *facile princeps* amongst synantherologists, who merges this subdivision in *Ligularia*, seems unimpeachable, and Maximowicz, indeed, speaks of *Senecillis* as a 'genus vix servandum.' The present plant, by its very convex receptacle, and the absence of pappus, may also be regarded as approaching *Doronicum*, which, however, has a biseriate involucrum, and in the typical species the achenes of the ray-florets only epappose. There is an Indian species, *Senecio belgaumensis*, agreeing with our plant in the entire want of pappus, which Mr. Clarke places under a separate section, *Madacarpus*, but I do not think

---

* Compositæ indicæ, 177 sqq.

† Mél. biolog. Acad. St. Pétersb. viii. 12 sq., ix. 292 sqq.

‡ Enum. pl. Japon. i. 246 sqq.

§ Sieb. & Zucc. Fl. Jap. tt. 35, 36.

‖ The Carpathian plant is considered distinct from the Polish one by Schott, Nyman & Kotschy (Analecta bot. 5.)

¶ De fruct. et sem. plant. t. 173.

** Mél. biolog. Acad. St. Pétersb. viii. 16.

†† A not ill-executed figure of this species, with magnified drawings of the florets, will be found in the 'Sô-Mokou-Zoussets' or Illustrated Flora of Japan (vol. xvii. t. 26), a most interesting and encouraging specimen of the progress of 'Young Japan' in western science, of which a second edition, with a French preface and a separate English index, was published in 1874. In this edition the Latin generic and specific names are printed on each plate.

‡‡ Gen. plant. ii. 449.

the solitary character justifies such a course,* and from Wight's plate,† and both his and Mr. Clarke's remarks, it is evidently much more like the true *Doronica* in habit, whilst the Chinese species certainly rather resembles the *Ligulariæ;* they are not, I think, naturally very closely allied, though technically, taking this peculiarity alone into consideration, they would come together.

Senecio phalacrocarpus, sp. nov.—Totus plus minus araneoso-tomentosus, rhizomate descendente fibras crassiusculas undique edente bulbillosque subrotundos pullulante, caule erecto robusto fistuloso ramoso 1½–2 pedali plurisulcato purpurascente, foliis subrotundo-cordatis vel reniformibus angulatis calloso-denticulatis supra viridibus pilosis subtus candido-araneosis pedatinerviis radicalibus longe caulinis mediocriter summis breviter petiolatis petiolis profunde canaliculatis basi dilatatis, corymbis caulem ramosque terminantibus subramosis fastigiatis 5–10 cephalis, capitulis longe pedunculatis basi ebracteolatis campanulatis diametro 1¼ polli-caribus, involucri bracteis 13 uniseriatis lanceolatis acutis 3-nerviis margine hyalinis 3 lin. longis demum reflexis, receptaculo hemi-sphærico fimbrillis brevibus ex achæniorum delapsorum cicatricibus consperso, ligulis 13 oblongis flavis apice 3-dentatis 6 lin. longis 1¾ lin. latis, florum radii tubo angusto parti campanulatæ circiter æquilongo, antheris ecaudatis, achænio oblongo fusco obtuse 10-striato glandulis brevibus oblongis hyalinis obsito, pappo tam flosculorum disci quam radii omnino nullo!

Secus fl. Lien-chan, prov. Cantonensis, m. Januario 1879, coll. Rev. E. Faber, societatis rhenanæ missionarius. (Herb. propr. n. 20924.)

SHORT NOTES.

A State of Carex pilulifera, *L.*, approaching *var.* Leesii.—The account in the 'Journal of Botany' for April of the variety of *C. pilulifera*, L., therein named *Leesii* by Mr. Ridley, has redirected my attention to a state or condition of this species which I have occasionally come across when botanising on commons near Plymouth. I have now a couple of specimens of it before me, gathered respectively on Vinerdon Down, E. Cornwall; and Roborough Down, S. Devon. Having compared them with Mr. Ridley's description and the accompanying plate, I find, with a considerable amount of general resemblance, the remarkably long glumes as in the variety. The Plymouth plants, however, I regard as simply a state or condition of *C. pilulifera* dependent on disease, for with their peculiar features I have always found aborted fruit, and in its place a fungus, to the presence of which I conclude all the differences between them and typical *pilulifera* are due. I have no doubt they constitute the *Carex Bastardiana*, DC., described by Boreau in his 'Flore du Centre de la France,' under

---

* Cfr. Messrs. Franchet & Savatier's note on the variableness of the pappus in some genera of Compositæ. (Enum. pl. Jap. ii. 397.)

† Icon. pl. Ind. or. iii. 1152.

C. pilulifera, thus: "Obs. Le *C. Bastardiana*, DC., paraît n'être qu'une déformation à écailles plus grandes, longuement acuminées et à fruits et étamines souvent remplacées par un Uredo" (p. 672, ed. 3). If Dr. Arnold Lees's Yorkshire specimens of the variety are quite free from disease, it is remarkable that in the neighbourhood of Plymouth disease in certain examples of *C. pilulifera* should lead to the production in them of points of agreement with that variety.—T. R. Archer Briggs.

Mr. Briggs has sent the specimens referred to in his note to the British Museum Herbarium, where I have had an opportunity of examining them. I cannot, however, perceive any very great resemblance between them and *C. pilulifera*, var. *Leesii;* the lower bract, so remarkable in that variety, is in Mr. Briggs's specimens quite similar to that of the typical form, as is also the general habit of the plant. It is almost impossible to make out the shape of the fruit in the specimens sent, owing to its destruction by the *Uredo;* the glumes are narrower and taper more gradually to the point. There is no trace whatever of any disease due to fungus or any other cause in *C. pilulifera*, var. *Leesii*.—H. N. Ridley.

Sonchus palustris in Cambridgeshire.—The Rev. W. W. Newbould has directed my attention to a specimen of this plant in the British Museum Herbarium, to which is attached a ticket, of which the following is a copy:—"Bottisham Fen, opposite to the Knave of Clubs. August 26, 1843." This is in the handwriting of Mr. Samuel Hailstone, and is of interest as bringing down the occurrence of the plant in Cambridgeshire to a much later period than is generally assigned to it. Prof. Babington says, "Near Stretham Ferry; Mr. J. Lyons. Not found there for many years; Relh. in 1820." (Fl. Camb., p. 143.)—James Britten.

Hertfordshire Oaks.*—It has been stated by the Rev. H. Cooper Key, in a paper in the Transactions of the Woolhope Naturalists' Field Club (1866, p. 178), that he had never yet met with a single specimen of the *sessiliflora* oak in the more eastern counties, as Hertfordshire and Middlesex, and that the oaks in Moor Park popularly supposed to have been pollarded by Anne, Duchess of Monmouth, after the execution of her husband, were all *Quercus pedunculata*, Ehrh. *Q. sessiliflora*, Salisb., has been recorded in the 'Flora Hertfordiensis' from several localities, among others the "woods by Pinner Lane;" and the late Rev. W. H. Coleman, more than thirty years back, was at considerable pains to discriminate the two Hertfordshire forms, and would appear to have exhibited illustrative examples, with accompanying notes, at a meeting of the Hertford Horticultural Society in the autumn of 1842. I have, however, examined Mr. Coleman's original specimens, and consider that they do not belong to the true *sessiliflora* of Salisbury and Smith, but must be referred to *Q. intermedia*, D.

* [This note and the following had been prepared by Mr. Pryor for this Journal, and were found among his papers.—Ed. Journ. Bot.]

Don, of which Martyn's figure (Flora Rustica, t. 11) is an excellent representation. It is probable, therefore, that the Durmast Oak of the New Forest does not occur in our county. On the other hand, it is not altogether unlikely that our second species or variety, the *sessiliflora* of Messrs. Webb and Coleman, may be identical with the Bay Oak of Ray, the "Quercus latifolia mas, quæ brevi pediculo est" of the 'Synopsis' (ed. 2, p. 286): "Folia huic obscurius viridia & minùs profundè sinuata quàm vulgaris, unde à vulgo circa Newberry oppidum The Bay-Oak, *id est*, Lauro-quercus dicitur;" a description that accords very well with the tree of Don. The whole question is worthy of careful examination; the timber, which seems to be very different in the true Durmast, and the position and arrangement of the buds, a point on which considerable stress has been laid by Œrsted (Aperçu sur la classification des Chênes), may help to throw some light on a subject on which both botanists and practical foresters are as yet very far from coming to an agreement.—R. A. Pryor.

An Early Notice of the Introduction of Seeds into England with Foreign Wool.—The following quotation is extracted from the 'Observations in Husbandry' of Mr. Edward Lisle, of Crux-Easton, in Hampshire; although published posthumously in 1776, the work dates from about 1693 to 1722, the year of the author's death. A practical agriculturist by predilection, and thoroughly acquainted with the literature of the subject, while he availed himself largely at every opportunity of the experience of others, he was also an original thinker, and even at this distance of time there is much that is suggestive in his remarks. I do not know whether the *Medicago* mentioned has held its ground in Wiltshire; but Mr. Lisle's statement is sufficient to show that the introduction of foreign seeds in imported wool has by no means been an occurrence of only recent date:—"Mr. Holyday, a considerable clothier in Wiltshire, was giving me an account, in the year 1707, that the Spanish wool was always troubled with a burr, and that, in cleansing some of the foulest of it, there came off more coarse foul wool than ordinary, so that he was tempted to lay it on his meadow ground to improve it, which brought forth a strange sort of grass, that had lasted ever since, it being many years ago. It was, he said, a three-leaved grass, and brought forth yellow flowers, and abundance of burrs, with seeds in them. I found this to be one of the annual medics I had in my garden, with burrs for the seed vessels, and by its seeding every year, I suppose, it maintained itself in his ground; but what I take notice of it for is this, he assured me, in picking the Spanish fleeces there were none but what had more or less of the burrs in them, which is an argument to me that the Spaniards sow much of this trefoil, it not being a native of their country, but brought from Persia. Quære if it may not be a very sweet seed to breed fine wool. It seems to me in the leaf to taste sweeter than hop-clover. I went to see this trefoil, and found it to be the lesser medic trefoil that had small burrs; but I since find by the clothiers that the Spanish wool has

been coarser for thirty years last past than formerly, which may be occasioned by their sowing these grasses."—Lisle's 'Observations in Husbandry,' p. 293.—R. A. Pryor.

Development of Heat in Flowers of Phytelephas.—It has long been an admitted fact that many plants at their season of flowering exhibit appreciable elevations of temperature: Lamarck, rather more than a century ago, was, I believe, the first to notice the phenomenon. As the few books I have had the time or opportunity of thus far consulting contain no mention of the behaviour of the Ivory Palm (*Phytelephas macrocarpa*), I now write to put briefly on record two or three observations respecting that plant. A fine example (female) was recently in flower in the House No. 1 at Kew. On April 20th, at 1 p.m., the temperature of this house was 68° Fahr.; the bulb of the thermometer, which had been suspended for some time near the plant in question, was placed in the centre of the cream-coloured inflorescence, and the mercury almost instantly rose to 92°, showing an increase in temperature of 24°. It is probably fair to assume that the normal temperature of a plant like the *Phytelephas*, with such a large surface for evaporation, &c., is considerably lower than that of the surrounding air; in any case the actual increase in temperature is remarkable. The following day, at the same hour, the thermometer registered 72° in the house, and, when placed in the same position in the centre of the inflorescence, only rose to the same height as that reached the preceding day, viz., 92°. As the drawn-out end of the bulb prevented it from actually touching the convex ovaries, a small incision was made in one of these, and the thermometer then rose to 94°. Within the last week *Philodendron sagittifolium*, with its anthers nearly ready to dehisce, showed a rise from 69° to 81°, and *P. eximium*, at a time when by sun heat the house had risen to 82°, exhibited a further increase of 10°. *Carludovica Plumieri* rose from 73° to 90°, but this last was certainly not in good condition, for the long barren stamens had already changed from creamy-white to cinnamon colour, and the spathe had commenced to decompose, although not three hours had elapsed since the flowers had opened.—George Nicholson.

Extracts and Notices of Books and Memoirs.

THE FLORA OF COLONSAY AND ORANSAY.

[In the last part (vol. xiv., part 1) of the 'Transactions of the Botanical Society of Edinburgh' is an interesting paper by Mr. Symington Grieve on the Flora of these islands of the Lower Hebrides. The islands seem not to have been previously examined botanically, the only record of plants from them being that in Lightfoot's 'Flora Scotica,' in which ten species are included. We extract the enumeration of species, referring our

readers for Mr. Grieve's introductory remarks to the paper itself. Those marked with an asterisk are new to vice-county 102 (Ebudes South) of 'Topographical Botany.'—Ed. Journ. Bot.]

Thalictrum minus, *var.* maritimum; *var.* flexuosum. Both found growing on sandy banks on shore of Kiloran Bay.
Ranunculus Flammula. Common.
R. acris.
R. repens.
Caltha palustris.
Nymphæa alba. Loch Fada.
Papaver Argemone. Cultivated field, Scallasaig.
Sinapis arvensis.
Cardamine pratensis.
C. hirsuta.
Arabis hirsuta.
Nasturtium officinale. Ditches, Kiloran and Scallasaig.
Viola sylvatica, *var.* Riviniana.
Drosera rotundifolia. Common near Loch Fada.
Polygala depressa.
Silene maritima. On cliffs near Scallasaig and ruins Oransay.
Lychnis diurna.
L. Flos-cuculi.
Cerastium tetrandrum.
C. triviale.
Stellaria media.
S. uliginosa.
Sagina procumbens.
Spergula arvensis.
Hypericum Androsæmum.
H. humifusum.
H. pulchrum.
Malva sylvestris, *var.* Under cliffs near ruins, I. Oransay.
Linum catharticum. Common, apparently wild.
L. usitatissimum. On quay at Scallasaig.
*Geranium sylvaticum.
G. pratense.
G. molle.
G. Robertianum.
Erodium cicutarium.
Oxalis Acetosella.
Ulex europæus. Kiloran and Kilchuttan.
Anthyllis Vulneraria.
Medicago lupulina.
Trifolium pratense.
Lotus corniculatus.
Vicia Cracca.
V. sepium.
Lathyrus pratensis.
L. sylvestris.
Spiræa Ulmaria.
Alchemilla arvensis.
A. vulgaris.
Potentilla Tormentilla.
P. Anserina.
Comarum palustre. Loch Fada.
Fragaria vesca.
Geum rivale.
Rosa spinosissima. Near Scallasaig.
R. tomentosa.
Pyrus Aucuparia.
Lythrum Salicaria. Near Scallasaig.
*Epilobium obscurum.
*Myriophyllum alternifolium. Loch Fada.
Sedum Rhodiola. Cliff west of island.
S. anglicum. Common.
S. acre. Not plentiful, but found near Scallasaig, and on Oransay.
Chrysosplenium oppositifolium.
Hydrocotyle vulgaris. Near Loch Fada.
*Sanicula europæa.
Petroselinum sativum.
Oenanthe crocata.
Ligusticum scoticum.
Angelica sylvestris. Near Scallasaig.
Heracleum Sphondylium.
Daucus Carota.
Hedera Helix.
Lonicera Periclymenum. Near Kiloran.
Galium verum.
G. saxatile.

G. Aparine.
Sherardia arvensis. Near Scallasaig.
*Valerianella olitoria. Near Scallasaig.
*Scabiosa arvensis.
Carduus lanceolatus.
C. palustris.
C. arvensis.
Arctium minus.
Centaurea nigra.
Chrysanthemum segetum.
C. Leucanthemum.
Matricaria inodora.
Achillea Millefolium.
Gnaphalium dioicum. Rocks on hill north of Scallasaig.
Senecio Jacobæa.
S. aquaticus.
Bellis perennis.
Tussilago Farfara.
Taraxacum officinale.
Campanula rotundifolia.
Vaccinium Myrtillus.
Arctostaphylos Uva-ursi. Common.
Erica Tetralix.
E. cinerea.
Calluna vulgaris.
Erythræa Centaurium.
Menyanthes trifoliata.
Digitalis purpurea.
*Veronica hederifolia.
V. arvensis.
V. officinalis.
V. Chamædrys.†
Euphrasia officinalis.
Pedicularis palustris.
P. sylvatica.
Rhinanthus Crista-galli.
Melampyrum pratense.
Mentha hirsuta.
M. arvensis.
Thymus Serpyllum.
Prunella vulgaris.
Lamium purpureum.
Ajuga reptans.
Teucrium Scorodonia.
Anchusa arvensis.†
Pinguicula vulgaris.
Primula vulgaris.
Lysimachia nemorum.
Anagallis tenella. Common.
Samolus Valerandi.
Armeria maritima.
Plantago maritima.
Salicornia herbacea. On shore near the quay, Scallasaig.
Rumex Acetosa.
R. Acetosella.
Polygonum aviculare.
Empetrum nigrum.
Euphorbia Helioscopia. Cornfield, Scallasaig.
Urtica dioica.
Myrica Gale.
Salix aurita.
S. repens.
Juniperus communis. Common.
Potamogeton polygonifolius.†
Orchis pyramidalis. Kiloran Bay.
O. mascula.
O. latifolia.
O. maculata.
Habenaria viridis.
*H. bifolia.
*Listera cordata.
L. ovata.
Iris Pseudacorus. Near Scallasaig, common.
*Scilla verna. Common near the coast.
S. nutans. Common.
Narthecium Ossifragum.
Luzula sylvatica.
Juncus effusus.
J. lamprocarpus.
J. supinus.
Schœnus nigricans.
*Scirpus lacustris.
Eriophorum angustifolium.
Carex stellulata.
C. vulgaris.
C. binervis.
*C. flava, *var.* lepidocarpa.

† [*Veronica montana*, *Myosotis palustris*, and *Potamogeton lucens* are given by Mr. Grieve in his preliminary enumeration of species new to the vice-county, but they do not appear in the body of the list.—Ed. Journ. Bot.]

Alopecurus geniculatus.
Agrostis vulgaris.
A. vulgaris, *var.* pumila.
Aira caryophyllea.
Avena pratensis.
A. elatior.
Holcus mollis.
Koeleria cristata.
Catabrosa aquatica.
Glyceria fluitans.
Cynosurus cristatus.
Dactylis glomerata.
Festuca ovina.
Bromus mollis.
Brachypodium sylvaticum.
Nardus stricta.
Hymenophyllum unilaterale.
Pteris aquilina.
Lomaria Spicant.
Asplenium Trichomanes.
A. marinum.
A. Adiantum-nigrum.
Athyrium Filix-fœmina.
Scolopendrium vulgare.
Cystopteris fragilis.
Aspidium aculeatum.
A. aculeatum, *var.* lobatum.
Nephrodium Filix-mas.
*N. spinulosum.
N. dilatatum.
*N. æmulum.
Polypodium vulgare.
Osmunda regalis.
Lycopodium selaginoides.
Equisetum sylvaticum.
E. limosum.
Sphagnum acutifolium, *Dill.* Scallasaig.
S. cymbifolium. Near Loch Fada.
Weissia viridula (controversa), *Hedw.*
Dicranum scoparium, Hedw.
Campylopus flexuosus, *Brid.* Rocks on hills, Scallasaig.
Leucobryum glaucum, *Hampe.* Common.
Barbula muralis, *Hedw.*
Racomitrium heterostichum, *Brid.*
R. lanuginosum.
R. canescens, *var.* ericoides.
Ptychomitrium polyphyllum, *B. & S.*
Ulota crispa (Orthotrichum), *Mohr.*
Bartramia pomiformis, *Hedw.* Near Scallasaig.
Philonotis fontana, *Brid.* Near Loch Fada.
Brentelia arcuata, *Schpr.* Near Loch Fada.
Bryum cæspiticium, *Dill.*
B. capillare.
B. pseudo-triquetrum.
B. roseum. On bank at side of road between Scallasaig and Kiloran.
Mnium hornum, *L.*
Aulacomnion palustre, *Schwg.* Near Loch Fada.
Polytrichum piliferum, *L.*
P. juniperinum.
P. commune.
Fissidens adiantoides, *Hedw.* Near Loch Fada.
Pterygophyllum lucens, *Brid.* Near Loch Fada.
Thuidium tamariscinum, *Schpr.*
Pterogonium gracile, *Swartz.*
Thamnium alopecurum, *Schpr.*
Climacium dendroides, *Brid.*
Isothecium myurum, *Brid.*
Homalothecium sericeum, *Schpr.*
Brachythecium rutabulum, *Schpr.*
Eurhynchium striatulum, *Schpr.*
E. prælongum.
E. pumilum. Walls of the new cave, Kiloran Bay.
Rhynchostegium rusciforme, *Schpr.*
Plagiothecium denticulatum, *Schpr.*
P. undulatum.
Hypnum commutatum, *Dill.*
H. cupressiforme.
H. cuspidatum.
H. Schreberi.
H. purum.
Hylocomium splendens, *Schpr.*
H. squarrosum.
H. loreum.
H. triquetrum.

Les Characées Généroises. By Dr. J. Müller (Mull. Arg.)

The second number of the 'Bulletin de la Société Botanique de Genève' (February, 1881) contains, under the above title, an account of the Charas which have been, are, or may be expected to be found in the neighbourhood of Geneva. Twenty-two species are described, under the two genera—*Chara* and *Nitella;* but it is a pity that the five species not yet found in the district should not be more clearly separated from the others than by a remark at the end of the description. The naming of forms of the common species of *Chara* is carried to excess, thirty-two varieties of *C. fœtida* (*C. vulgaris*), for instance, are described, at least two of which would probably occur in any gathering of the plant. Had some of the time spent in attempting to discriminate these forms been devoted to more carefully examining the literature of the subject, we should probably not have to regret that the references to the original descriptions of eleven out of the twenty-two specific names used should be more or less incorrect, and that several previously described varieties should be given as new.

H. & J. G.

The 'Transactions of the Hertfordshire Natural History Society' for December last contains a paper by the Rev. G. Henslow on the 'Homology and Analogy of Plant Organs.' It is a comprehensive summary of numerous and varied observations; but, as it appears to us, is somewhat out of place in the Transactions of a local Society.

The 'Transactions of the Epping Forest and County of Essex Naturalists' Field Club,' issued last December, contains papers on 'The Preservation of Plants with their natural colours,' by James English; and a 'Note on an abnormal form of *Cardamine pratensis*,' by John Gibbs: the latter monstrosity is one so well known that it hardly deserves special prominence.

Dr. Braithwaite is pushing forward his 'British Moss-Flora' with commendable energy; the fourth part, containing the *Fissidentaceæ*, with three plates of characteristic excellence and accompanying text, is now before us, containing also a useful glossary of the terms employed in the book. This completes the first section of the work; and subscriptions for the second section (to comprise the *Leucobryaceæ* and *Dicranaceæ*) are invited. There must be many who could well afford to encourage so important and useful an undertaking, and half-a-guinea could hardly be more profitably spent than in so doing. We are sorry that Dr. Braithwaite adheres to a method of nomenclature which we can but regard as founded upon a misconception: "*Fissidens Orrii*, Lindb.," is not an accurate statement of the name of this moss, which Lindberg published as a *Schistophyllum*. We note a description and figure of *Fissidens rufulus*, a species (from Westmoreland) new to the British moss-flora.

The Report for 1880 of the Science-Gossip Botanical Exchange Club, published in 'Science-Gossip' for February last, contains one or two statements with regard to critical plants of sufficient importance to make it desirable that the authority upon which these rest should be made public; little value can be attached to the anonymous determination of such plants as *Thalictrum Kochii*, which, we believe, has not been satisfactorily shown to be a native of Britain. We have now three botanical collecting clubs; and we cannot refrain from once more expressing our conviction that the cause of science would be furthered by the amalgamation of these into one organisation, more especially as we find that some botanists already belong to more than one, if not to the whole of them.

New Books.—B. D. Jackson, 'Guide to the Literature of Botany' (Dulau, 31*s.* 6*d.*)—Ch. Contejean, 'Géographie Botanique' (Paris, Baillière).—P. Brousse, 'L'Etude des Fruits' (Montpellier, Hamelin).—I. Löw, 'Aramaeische Pflanzennamen' (Leipzig).

Articles in Journals.—March.

Annales des Sciences Naturelles (Botanique, Ser. vi. t. x. n. 5).—E. Bescherelle, 'Florule Bryologique de la Réunion' (contd.)

Botanische Zeitung.—H. Hoffman, 'Cultural Experiments upon Variation' (concluded).—E. Giltay, 'On the Collenchyma.'—E. Zacharias, 'On the Chemical Composition of the Cell-nucleus.'—A. F. W. Schimper, 'Researches on the growth of Starch-granules' (1 tab.)

Bulletin of Torrey Botanical Club.—(Jan.) F. Wolle, 'New American Desmids' (1 tab.)—E. L. Greene, 'A new *Asclepias* (*A. pinifolia*) from Arizona.'—(March) E. L. Greene, 'Emendation of the genus *Fendlera*.'—J. B. Ellis and W. H. Harkness, 'New North American Fungi.' 'The Herbaria and Botanical Libraries of the United States' (contd.)—W. R. Gerard, '*Æcidium Rusbyi*, n. sp.' (New Mexico).

[Coulter's] *Botanical Gazette*.—J. C. Arthur, 'Trichomes of *Echinocystis lobata*' (1 tab.)—E. L. Greene, 'New Plants of New Mexico and Arizona' (*Talinum humile*, *Linum neomexicanum*, *Bigelovia rupestris*, *B. juncea*, *Hieracium carneum*, *Euphorbia versicolor*, *Tradescantia tuberosa*, spp. nn.)—J. W. Chickering, '*Rudbeckia rupestris*, n. sp.' 'Flora of Indiana' (contd.)

Flora.—(Feb.) C. Kraus, 'Researches on the course of the sap.'—G. Limpricht, 'On *Gymnomitrium adustum*.'—O. Boeckeler, 'Critical Remarks on Wright's Cuban *Cyperaceæ*.'—J. Müller, 'Lichenological Contributions,' no. xii.

Grevillea.—M. C. Cooke and W. H. Harkness, 'Californian Fungi' (contd.: *Harknessia*, gen nov.)—M. C. Cooke, 'Notes on British Desmids.'—Id., 'On *Thelephora Lycii*.'—Id., 'Some Exotic Fungi.'—Id., 'New British Fungi.'—'Id. and J. B. Ellis, 'New

Jersey Fungi.'—Id. and W. Phillips, 'Reliquiæ Libertianæ.'—C. Kalchbrenner, 'Fungi Macowaniani.'

Hedwigia.—E. Rehm, '*Ascomycetæ*,' fasc. xii.—R. Wollny, 'On the fructification of *Chætopteris plumosa*.'

Journal of Quekett Microscopical Club.—'Desmids new to Britain in 1880.'

Midland Naturalist.—J. E. Bagnall, 'Flora of Warwickshire' (contd.)

Œsterr. Bot. Zeitschrift.—H. Wawra, 'New Plants' (*Swainsonia Murrayana*, *Scutellaria mussooriensis*, *Hyptis Itatiaiæ*, *Hedeoma Itatiaiæ*, *Palicourea brasiliensis*, *Coccocypselum geophiloides*, spp. nn.) M. V. Sardagna, 'Flora of Trentino.'—E. Flek, '*Crocus vernus* in the Carpathians.'—M. Gandoger, 'Pugillus plantarum novarum' (forms of *Ægilops triaristata* and *Gaudinia fragilis*).—P. G. Strobl, 'Flora of Etna' (contd.)

Botanical News.

Mr. L. J. K. Brace, of New Providence, Bahamas, has been appointed to the Curatorship of the Herbarium of the Royal Botanic Gardens, Calcutta.

Dr. S. Berggren has been appointed Professor at the University of Upsala.

Mr. F. A. Lees has offered the MS. of his West Riding Flora to the Yorkshire Naturalists' Union for publication.

Jacob Boll, the author of a small work on the Flora of Bremgarten, Switzerland (1869), died on the 29th September, 1880, in Texas, whence he had twice sent collections of mosses and lichens. He was born in 1828.

A collection of mosses and lichens made by Richard Warner, the author of 'Plantæ Woodfordienses,' has been presented to the Epping Forest and County of Essex Naturalists' Field Club.

The death is recently announced of John Francis Drège, at the advanced age of eighty-seven. He was a native of Altona, in Prussia, and in 1826 commenced his extensive botanical investigations in South Africa. These lasted for eight years, during which time he traversed the interior of Cape Colony, making collections which are estimated to have contained 200,000 specimens, belonging to 8000 species. A full account of the country investigated by him, and descriptions of a large number of his novelties, will be found in the 'Commentariorum de plantis Africæ Australioris,' by his friend Ernest Meyer (published in 1835—1837), among them the genus *Dregea*, with the graceful dedication—"Amico cui tantas Floræ divitias exquisitissimas debemus, dicatum, spero fore, ut et duret et accrescat."

Original Articles.

NOTE ON *CAREX FLAVA*, L.

By F. Townsend, M.A., F.L.S.

"*Carex flava* var. *argillacea*, MS. Parkhurst Forest, Isle of Wight."—I contributed specimens, thus labelled, to the Botanical Exchange Club last year, and they are noticed in the Report as "a luxuriant form of *C. lepidocarpa*, Tausch."

The plant is certainly *C. lepidocarpa* of Syme, Eng. Bot. Ed. III., but it is not *C. lepidocarpa* of Tausch, the original describer of that supposed species, and though, in a sense, it may be convenient, yet I think it incorrect to apply Tausch's name to a plant with characters so opposite to those given by him for his *C. lepidocarpa*. What is *C. lepidocarpa*, Tausch? Let the author of the species speak for himself. He supposed that two distinct species were confounded under the name *C. flava*, L., and in the 'Allgemeine botanische Zeitung,' No 12, p. 179 (Regensburg, 1834), he described both as follows:—

"5. *C. lepidocarpa*. Spica ♂ solitaria longe exserta, ♀ 2, 3 remotis ovatis, infima pedunculata bractea lineari elongata vaginante suffulta, stigmatibus 3, fructibus inflato-tumidis suborbiculatis compressis nervosis rostro 2-dentatis retrorsum dense imbricatis, culmo subfiliformi scabro." *C. flava*, Host, germ. [Gram.] 1 t. 63 (pl. florifera)."

"6. *C. flava*. Spica ♂ solitaria subsessili, ♀ 2, 3 subconfertis ovatis, infima pedunculata bractea foliacea elongata vaginante suffulta, stigmatibus 3, fructibus inflatis tumidis ovatis nervosis rostro 2-dentatis reflexis, culmo lævi. Hac *C. patula*, Host, 1 t. 69 [64]. This last varies with large and small fruit, and there is also a dwarf var. *C. Œderi*, auct. pl. (*C. flava*, γ. Willd. Spec. pl. 4, p. 269). *C. flava* and *C. lepidocarpa* grow intermingled, and are easily distinguished from one another, both in flower and in fruit; therefore, I have myself always recognised them as distinct species."*

The specimen figured by Host, and referred to by Tausch as representing his *C. lepidocarpa*, is 15½ inches in height from the collar of the root to the apex of the male spike; the leaves are somewhat narrow and not half the length of the stem, the latter is rather

* The quotation is translated from the German. Tausch could not have known true *C. Œderi*; he probably mistook for that species, or included in it, a dwarf form of *C. flava*, which botanists now usually label *C. lepidocarpa* in herbaria. Billot distributed as *C. Œderi* similarly dwarf forms of *C. flava*, and I have seen them labelled *C. Œderi* by continental botanists: instances occur in the British Museum Herbarium.

slender; the bracts are reflexed, the lower one exceeding the long-stalked male spike; the two female spikes are distant and oval-oblong; the fruit is rather large, and has a long and strongly deflexed beak. In the following year (1835) Hoppe published a lengthened description of *C. lepidocarpa*, Tausch, with a plate (H. 57, No. 8), in Sturm's 'Deutschland's Flora.' He describes the leaves as half the length of the stem, and as narrower than those of *C. flava*, L. In 1838 Bluff and Fingerhut give a description which is almost word for word that of Tausch, and add "Crescit iisdem in locis, ubi *C. flava* et in ejus consortio . . . (*C. flavæ* proxime affinis, distinctam esse ferunt: culmo tenuiore simulque longiore; foliis angustioribus; spica ♂ longius pedunculata, pedunculo sc. spicam ♀ fructiferam longe superante; spica ♀ ima exserte-pedunculata; fructibus minoribus magis rotundatis; squamis apice rotundato-obtusis obscurius coloratis spadiceis. Distinctas proponere placuit *C. flavam*, *Œderi* et hanc, quamquam unius typi forte nonnisi formæ sint, ut ulterioribus institutis observationibus characterum differentialium pretium satius statuatur)." Bluff and Fing., pp. 648–9.

To recapitulate, it will be seen that Bl. & Fing. distinctly state that Tausch's plant is taller than *C. flava*, and that the stem is scabrous. Hoppe, and also Bluff and Fingerhut, state that the leaves are narrower. Tausch further states that the male spike is long stalked, that the female spikes are distant, and that the beak of the fruit is reflexed. He says nothing about the size of the fruit, but under *C. flava* he states that the latter varies with large or small fruit.

Now the Parkhurst Forest Carex has very broad leaves, as long as or even longer than the stem, a short sessile male spike, approximate and even crowded female spikes, and the fruit has a short and nearly straight beak—characters so opposed to those quoted above by Tausch and others for *C. lepidocarpa* that I could not justly apply that name, and as the Parkhurst Forest plant represents a form of *C. flava* which I have only seen on clay soils, I thought it well to distinguish it by a varietal name. My own observations of *C. flava*, as seen growing in England and Scotland and on the Continent,* lead me to believe that it is a very variable species, variable in height, in the length and width of the leaves, in the length of the peduncle of the male spike, and in the length of the spike itself; in the number, position, and form of the female spikes, these being crowded or more or less distant, oval, ovate, or oblong in form; in the size of the fruit, in the narrowing at its base, in the length and direction of the beak, this being more or less deflexed, and even sometimes straight.

Dr. Boswell's description of *C. flava* as an aggregate is an excellent one, but the characters given by him for his *α genuina* and *β lepidocarpa* are not altogether in accordance with the views of continental botanists or with my own observations, and in conformity with these I would describe the varieties proper thus:—

* Notably in the upland boggy pastures of the Jura.

Var. *α genuina*.—Leaves shorter than the stem, male spike nearly or quite sessile, female spikes contiguous, lowest bract much exceeding the male spike; fruit considerably narrowed towards the base, and gradually narrowing above into a much deflexed beak, which is as long as the rest of the fruit.

Var. *β C. lepidocarpa*, Tausch.—Stem scabrous; leaves narrow, shorter than the stem; male spike long-stalked, female spikes distant, ovate; fruit crowded, suborbicular, beak long, strongly deflexed. A rare and local form.

Var. *γ minor*.—Stem shorter than in var. *α*; leaves commonly as long as or even longer than the stem, male spike usually stalked, female spikes usually distant; fruit smaller, suborbicular, more suddenly contracted into a less deflexed or straight beak, which is shorter than the rest of the fruit. This is the common British form.

Var. *δ argillacea*.—Leaves broad, as long as or longer than the stem; male spike short sessile, female spikes contiguous; fruit suborbicular, beak short, straight. On clay soil. This var. I have observed to flower twice in the year.

In the case of so variable a species as *C. flava*, where the varieties "shade so imperceptibly into one another that it is merely an arbitrary line which can be drawn between them," it is a question whether it be not advisable to refrain from giving varietal names. The last quotation is from Dr. Boswell's concluding remarks on this species, and I can fully endorse them.

A REVISION OF THE INDIAN SPECIES OF *LEEA*.

By C. B. Clarke, M.A., F.L.S.

(Concluded from p. 142.)

Sect. 7. Æquatæ. Leaves 2–3-pinnate, hairy beneath; primary nerves not very close and parallel as in Sect. *Pycnoneuræ*. Trees and shrubs.

25. L. æquata, Linn. Mant. 124; leaflets lanceolate beneath, with hairs and scattered flat circular discs, corymbs 2–4 in. diam. stout hairy, bracts deciduous early or inconspicuous.—Miq. in Ann. Mus. Lugd. Bat. i. 98; Kurz in Journ. As. Soc. 44, ii. 178, 180; For. Fl. i. 281.—*L. hirta*, Hornem. Hort. Hafn. i. 237; Roxb. Fl. Ind. ed. Wall. ii. 469; Blume, Bijd. 197; Wall. List, 6822; Decne. in Ann. Mus. d'Hist. Nat. iii. 446; Miq. in Fl. Ind. Bat. i. pt. ii. 612; Laws. in Fl. Brit. Ind. i. 668.—*L. hirsuta*, Blume, Bijd. 197; Miq. in Fl. Ind. Bat. i. pt. ii. 612.

From Sikkim and Bhotan to Tenasserim, alt. 0–3000 feet; common throughout Bengal Plain.—Distrib. Malaya.

A shrub, 4–10 feet, branchlets villous. *Leaflets* 7 by 1¾ in., acuminate, obtuse at the base, hairy on the upper surface at least when young, primary nerves 12–15 on each side the midrib, ½ in.

apart; denticulations of the margin shallow irregular; secondary nerves parallel, distinct; petiolules often ¼ in. *Berry* ¼ in. diam., black; pyrenes 6–3.—In Linnæus' Herbarium the single sheet of *L. æquata* contains one piece of the true plant, with a fragment of *L. sambucina*. *L. æquata* is rarely mistaken, as every example has the flat glandular discs which are found on no other *Leea*.

26. L. ROBUSTA, Roxb. Hort. Beng. 18, Fl. Ind. ed. Wall. ii. 468.—Leaflets broadly lanceolate pilose on the nerves beneath without flat glandular discs, corymbs 6–12 in. lax with many thin branches puberulo-pubescent, bracts deciduous early or inconspicuous.—Wall. List, 6826; W. & A. Prodr. 132; Kurz in Journ. As. Soc. 44, ii. 178, 180, For. Fl. i. 279, not of Laws.—*L. aspera*, Wall. List, 6825, not of Edgw.—*L. diffusa*, Laws. in Fl. Brit. Ind. i. 667.

Bengal, Burma, Tenasserim, scattered widely in the lower hills, alt. 500–2500 feet, nowhere abundant. Nepal, *Wallich*; Sikkim, *C. B. Clarke*; Khasia, *H. f. & T.*, *C. B. Clarke*; Mudhopoor Jungle (East Bengal Plain), *C. B. Clarke*; Circars, fide *Roxburgh*; Chota Nagpore (in Singhbhoom), *C. B. Clarke*; Meera Donger (near Bombay?), *Dalzell*; Tenasserim or Andamans, *Helfer*, Kew Distrib. n. 1294, 1295. Pegu and Tenasserim, frequent, fide *Kurz*.

Resembling generally *L. æquata*, but with a very compound slender-branched panicle scarcely villous, the leaflets without glandular discs. Leaflets thinner, glabrous above or with sparse hairs when young. *Berry* steely black, pyrenes 6–4.—There can be no question that Kurz and King have got Roxburgh's *L. robusta*, and that Lawson has not, as Roxburgh's Ic. ined. of his *robusta* is at Kew.

27. L. BRACTEATA, Herb. Kew.—Leaflets large broadly or ovate lanceolate shortly caudate hispidulous on the nerves beneath, corymbs 4–6 in. dense, bracts ¼–½ in. ovate and lanceolate very persistent, ripe berries brownish yellow.—*L. robusta*, Laws. in Fl. Brit. Ind. i. 667, in chief, excluding all syn.; not of Roxb., nor of Blume.

Sikkim and Khasia, alt. 500–4000 feet, very common, *Griffith*, *H. f. & T.*, *Dr. Treutler*, *C. B. Clarke*; Oudh Terai, *Col. R. Thompson*.

A large straggling shrub, 6–16 feet; or sometimes (in the Teesta lower gorge) a tree 30 feet high, with a clean trunk 15 feet. Leaves 2-pinnate (never, so far as I recollect, 3-pinnate); upper often 1-pinnate; leaflets often 9 by 3¼ in. *Petals* green; staminal tube yellow to orange, lobes subentire.—This can be confounded with no other species except *L. compactiflora*, Kurz, which is glabrous. It is remarkable that so marked, plentiful, and accessible a species should have escaped Wallich and all the older collectors, until H. f. & T. secured a large quantity of it in every stage. The berry is fully ripe when orange-yellow, withers only to dull black. Kurz (in Journ. As. Soc. 44, ii. 180), identifies this species with *L. Sundaica*, Miq., which must be altogether wrong, for neither in Miquel's description nor in his authentic examples of that species

are there any bracts. *L. Sundaica*, Miq., really is *L. robusta*, Blume, and Kurz perhaps jumped to a conclusion.

28. L. Kurzii, C. B. Clarke.—Leaflets large oblong-lanceolate closely denticulate thin softly pilose, corymbs 2–4 in. dense stout, bracts ¼ in. narrowly oblong.

Andamans, Watercove, *Kurz*.

Kurz marked this *L. hirta*, i.e., *L. æquata*, Linn., and it may be a variety of that plant; but in the very thin leaves and absence of glandular discs on their lower surfaces it certainly differs from every other example of *L. hirta*. It seems indeed quite as near as *L. bracteata*, from which, however, it is well distinct by the secondary nervation, which is open reticulate, not closely parallel. Kurz's single specimen is in fragments; the terminal shoot is densely shaggy, with brown hairs standing out on all sides; I can find nothing like it in *Leea*.

29. L. javanica, Blume, Bijd. 197.—Leaflets elliptic-lanceolate acuminate pubescent on the nerves beneath, corymb divaricate wide-spreading rusty-pubescent upwards, bracts small caducous.—Miq. in Ann. Mus. Lugd. Bat. i. 100.

Singapore, *Sir R. Schomburgk*, n. 86.—Distrib. Java, Celebes.

A large shrub. Upper leaves bipinnate; so much resembling those of the Bengal *L. sambucina* that Schomburgk's example has been named *sambucina?* But not only are the leaves pubescent beneath; the very wide and rusty-pubescent corymb is unlike that of *L. sambucina*.

Species Excluded from the Genus.

Leea odontophylla, Wall. List, 6820, from the Irrawaddy Bank.—The Wallichian example consists of two detached leaves, which are, I believe, the common Khasi *Vitis* arranged by Lawson as a glabrous form of *Vitis lanata*, Roxb.

Leea cordata, Wall. List, 6819, from Ava, is a *Vitis* in half-ripe fruit; a species erect, without tendrils (so far allied to *V. spectabilis*, Kurz), but with the peduncles exactly *intra-axillary* between the persistent lanceolate stipules.

APPENDIX.

Species of Leea, not included in the foregoing Catalogue of Indian Species, which I have seen at Kew or the British Museum, but have only noticed cursorily.

Sect. 2. Lætæ.

30. L. serrulata, Miq. in Ann. Mus. Lugd. Bat. i. 99.—The imperfect example communicated cannot be separated from *L. acuminata*, Wall.

Sect. 3. Rubræ.

31. L. linearifolia, C. B. Clarke.—Nearly glabrous, upper leaves 3-pinnate, leaflets 2½ by ¼–⅓ in., peduncles long slender, corymbs small, petals red.—Cambodia, *Lebeuf*, n. 214.—Closely allied to some Indian forms of *L. rubra*, Blume.

32. L. Cumingii, C. B. Clarke.—Stems very rufous shaggy, leaves large 3-pinnate, leaflets elliptic-lanceolate rufous-villous on both surfaces.—Philippines, *Cuming*, n. 1379.

33. L. Manillensis, Walp. in Nov. Act. Cæs. Leop. xix. Suppl. i. 314.—Nearly glabrous, leaves 3-pinnate, leaflets elliptic-lanceolate acuminate serrate, corymbs peduncled large compound, petals rose-red.—Manilla, *Meyen*, *Cuming* n. 607.

34. L. Brunoniana, C. B. Clarke.—Nearly glabrous, upper leaves 2- (or often 3-) pinnate, leaflets elliptic very shortly acuminate, primary nerves numerous continued nearly to the margin often setulose, corymbs glabrous.—Australia, *R. Brown*, n. 5272; Port Darwin, *Schultz*, n. 627.—Called *L. sambucina* by Benth. (Fl. Austral. i. 451), but not merely the colour of the flowers, but the nervation of the leaves totally differs from *L. sambucina*, Willd. The present species is like a very handsome well-developed *L. rubra* or *L. setuligera*.

35. L. guineensis, G. Don, Gen. Syst. i. 712.—Shrubby, flowers sessile small, petals deep-red, staminal tube yellow-white.—*L. sambucina*, Thonn. in Schum. Guinea Pl. 134; Baker in Oliv. Fl. Trop. Afr. i. 415, not of Willd.—*L. coccinea*, Bojer Hort. Maurit. 61 (? of Planch.)—Sierra Leone, Niger, Congo, Angola, Abbeokuta, Monbotto-Land, Zambesi, Mauritius, Madagascar.

Var ? *arborea*, Bojer Hort. Maurit. 61, n. sp. — Arborescent, flowers less capitellate much larger, petals rose, staminal tube yellow-white.—Mauritius, Bourbon, Madagascar, Comoro Isles.

Sect. 5. Paucifoliolosæ.

36. L. simplicifolia, Zoll.; Miq. in Ann. Mus. Lugd. Bat. i. 101.—Sumatra.—A distinct species, but the flowers are perhaps red.

37. L. Zippelliana, Miq. in Ann. Mus. Lugd. Bat. i. 101.—New Guinea.—Nearly allied to *L. simplicifolia*.

38. L. Celebica, C. B. Clarke.—Uppermost leaf (at least sometimes) 1-pinnate with at least 7 leaflets, leaflets very large ovate lanceolate acute sparsely patently pilose beneath, corymb spreading rusty-pubescent.—Celebes, *Riedel*.—Leaflets 6 by 4 in. This seems related to *L. grandifolia*, Kurz, much as *L. latifolia*, Wall., is to *L. macrophylla*, Roxb.

Sect. 6. Sambucinæ.

39. L. biserrata, Miq. in Ann. Mus. Lugd. Bat. i. 99.—There treated as a *var.* of *L. sambucina*, Willd., which appears the true affinity. The imperfect example communicated looks exceedingly like *L. gigantea*, Griff.

40. L. horrida, Teijs. & Binn. Cat. Hort. Bog. 1866, 169.—Stem prickly, otherwise much like *L. sambucina*.—Java.

41. L. angulata, Korth.; Miq. in Ann. Mus. Lugd. Bat. i. 97.—A prickly stemmed species; the fragments communicated cannot be distinguished from *L. horrida*, Teijs. & Binn.

Sect. 7. Æquatæ.

42. L. Sundaica, Miq. in Ann. Mus. Lugd. Bat. i. 96.—Leaves large bipinnate rusty hairy beneath, corymb peduncled very compound rusty villous, without prominent bracts or bracteoles.—*L. robusta*, Blume, Bijd. 198, not of Roxb.—Java.—This species is much more closely allied to *L. robusta*, Roxb., than to any other species; not much differing therefrom, save in the rusty villous corymb.—*L. fuliginosa*, sp. Miq. in Fl. Ind. Bat. Suppl. 518, is reduced as a *var.* of *L. Sundaica* by himself in Ann. Mus. Lugd. Bat. i. 96, and does not appear to differ, except by the 3-pinnate leaves, which are not common in the allied Indian species.

43. L. pubescens, Zipp.; Miq. in Ann. Mus. Lugd. Bat. i. 97.—Timor.—The authentic example of this seems very near *L. Javanica*.

Entirely different from every other species in the genus is—

44. L. tinctoria, Lindl.; Baker in Oliv. Fl. Trop. Afr. i. 416.—Flower-buds ½ in. long and upwards.—Isle of St. Thomas; West Tropical Africa.

NOTES ON IRISH PLANTS.

By H. C. Hart, B.A.

During a short visit, in the summer of 1880, to my friend Mr. Chas. B. Barrington, of Glenstal, who takes much interest in the flora of his county, we made several excursions together in the surrounding neighbourhood; and, as that part of Ireland has been very little explored botanically, my notes record many additions to the flora of Districts VI. and VII. of Moore and More's 'Cybele Hibernica,' which I now proceed to enumerate. A day upon Keeper Mountain yielded us no varieties, but a slight sketch of the vertical range of its plants may be useful to those botanists who take an interest in this subject.

At the summit, 2278 feet, occurred:—*Potentilla Tormentilla*, *Galium saxatile*, *Vaccinium Myrtillus*, *Calluna vulgaris*, *Rumex Acetosa*, *Empetrum nigrum*, *Luzula campestris*, *Juncus squarrosus*, *Scirpus cæspitosus*, *Luzula sylvatica*, *Eriophorum angustifolium*, *Anthoxanthum odoratum*, *Aira flexuosa*, *Agrostis vulgaris*, *Festuca ovina*, *Aspidium dilatatum*. At 2200 feet:—*Solidago Virgaurea*, *Erica cinerea*, *Jasione montana*, *Melampyrum pratense*. At 2000 feet:—*Cerastium triviale*, *Vaccinium Vitis-Idæa*.

Although there is a suitable range of cliffs, with a northern aspect, on the north side of Keeper Mountain, I failed to gather any alpine plant there, excepting *Vaccinium Vitis-Idæa*, which also occurs near the summit on the south side. In a glen, flanking the upper side of Ballyhourigan Wood, upon the south side of Keeper, *Cystopteris fragilis* occurs sparingly, and with it *Lathyrus macrorrhizus*; on the moorland a little above the wood, *Carex ovalis* may

be gathered; while at its lower extremity I noticed *Lastrea Oreopteris*. These last three plants were not previously recorded from District VII.

I will now give a list of the localities for the rarer plants noticed. When a plant is an addition to the district in which it occurs, the expression "District 6" or "District 7" will be found inserted after the locality given. Where the discovery is due to my friend Mr. Barrington, his initials C. B. B. follow.

Meconopsis cambrica, Vig. Frequent about Six-mile Bridge, Co. Clare. C. B. B.

**Chelidonium majus*, L. Glenstal; District 6.

Cerastium glomeratum, Thuil. Roadside between Keeper and Newport; District 7.

[*Malva borealis*, Wallm. Waste ground near a gate lodge, Glenstal; District 6. C. B. B.]

M. moschata, L. Glenstal; District 6.

[*Geranium phæum*, L. Naturalised in waste ground, Glenstal; District 6. C. B. B.]

‡*G. sylvaticum*, L. In several places at Glenstal, where it has been known for the last twenty years; District 6, C. B. B.

Rhamnus catharticus, L. Near Newport by the roadside.

Ulex Gallii, Planchon. Clare Glen, near Glenstal; District 7.

Lathyrus macrorrhizus, Wimm. Ballyhourigan Wood, Keeper Mountain; District 7.

‡*Prunus Padus*, L. Glenstal, where it is called "Mazzard." C. B. B.

Rosa arvensis, Huds. Roadside between Newport and Keeper Mountain; District 7.

‡*Pyrus Malus*, L. Glenstal; District 6. C. B. B.

Callitriche hamulata, Kutz. Glenstal; District 6.

Pimpinella magna, L. Between Boher and Glenstal by the side of the road; at Anna Cotty; and roadside near Newport; District 7.

Sium angustifolium, L. Ballymackkeogh Bog, between Glenstal and Castle Connell; by the railway near Drumkeen Station.

Oenanthe crocata, L. Glenstal; District 6.

**Dipsacus sylvestris*, L. Roadside between Boher and Glenstal.

Scabiosa arvensis, L. Glenstal, and roadside between Limerick and Glenstal; District 6.

**Tanacetum vulgare*, L. Roadside near Glenstal.

**Cichorium Intybus*, L. Glenstal; District 6. C. B. B.

Crepis paludosa, Mœnch. Glenstal, by the Mulcaher River; District 6.

Jasione montana, L. Keeper Mountain; District 7.

Lycopus europæus, L. Roadside between O'Brien's Bridge and Castle Connell where the railway crosses. Little islands and eastern shore of Lough Derg, near Killaloe; District 7.

Pinguicula vulgaris, L. In one place at Glenstal. C. B. B. I saw it nowhere else in Limerick or Tipperary.

Rumex Hydrolapathum, Huds. In a bog where the Limerick and Killaloe Railway crosses the road from O'Brien's Bridge to Castle Connell, and in the neighbourhood around. C. B. B.

Euphorbia hyberna, L. There is a record in the 'Cybele Hibernica'—"It grows abundantly near Anakirk, in the county of Limerick; K'Eogh (1736)"; their habitat has never since been verified, nor is there any other known Limerick locality. Mr. C. B. Barrington cannot find out any place named "Anakirk" in his county.

Juniperus nana, Willd. Along the shore of Lough Derg at the northern point of Youghal Bay; District 7. C. B. B.

Potamogeton densus, L. Dromineer Bay, Lough Derg; and along the shores of islands and both sides of Lough Derg at Killaloe; District 7.

P. lucens, L. Both shores of Lough Derg near Killaloe; District 7.

P. perfoliatus, L. With the last; District 7.

Butomus umbellatus, L. Shores of island in Lough Derg, near Killaloe. C. B. B.

Orchis pyramidalis, L. Dromineer, Lough Derg.

Gymnadenia conopsea, Brown. With the last.

Carex ovalis, Good. On Keeper Mountain, a little above the upper border of Ballyhourigan Wood; District 7.

Carex Pseudocyperus, L. Ballymackeogh Bog, near Newport; District 7.

Phalaris arundinacea, L. Dromineer Bay, Lough Derg.

Hymenophyllum tunbridgense, Sm. Glenstal, Cappercullen stat.; District 6.

Trichomanes radicans, Swartz. This fern was shown to me in four distinct localities, all near Glenstal. C. B. B.: two of them cross the boundary into Tipperary. The Tipperary localities were found by my friend Mr. Croker Barrington. They form an important addition to the flora of District 7.

Cystopteris fragilis, Bernh. In a glen on the borders of Ballyhourigan Wood, Keeper Mountain, sparingly.

Lastrea Oreopteris, Presl. In Ballyhourigan Wood, Keeper Mountain; District 7.

Equisetum sylvaticum, L. Near Glenstal, by the Dooglasha; District 6.

E. maximum, Lam. Roadside between Newport and Glenstal, in two or three places; Districts 6 and 7.

The above list of additions to the flora of the Counties Limerick and Tipperary includes several conspicuous and not uncommon plants, and it is obvious that the Botany of this part of Ireland is very imperfectly known. Some common plants, which undoubtedly occur in these districts, are still unrecorded, and it is probable some varieties await further exploration. I do not think the flora is a rich one, but I would specially direct observation to the shores, islands, and waters of Lough Derg, whose eastern side seems to have been hardly visited by a botanist. *Inula salicina* in its only British locality, *Teucrium Scordium*, and the more than dubiously native *Sisyrhynchium anceps* (*Bermudianum*), all three occur on the western shores of this neglected lake.

NOTES ON RADNORSHIRE PLANTS.

By Henry N. Ridley, M.A., F.L.S.

In August of last year I made a few botanical excursions into Radnorshire, a county hitherto but little visited by botanists, and one of the nine counties omitted almost entirely from Watson's 'Topographical Botany,' on account of the scantiness of the records of its flora.

The flora differs somewhat remarkably from that of the adjoining county of Hereford, and this I consider to be to a considerable extent due to the difference of the geology of the district, Herefordshire being almost entirely composed of old red sandstone and clay, whereas the localities visited in Radnorshire were either Silurian or volcanic rocks. The Stanner Rocks are remarkable to a geologist from their being charged with hypersthene, a mineral found in only one or two other localities in Britain; they are also remarkable for their very peculiar flora, especially for the presence of *Scleranthus perennis* and *Veronica hybrida:* the former of these plants appears to be only known in Britain from Norfolk and Suffolk and this locality; the latter occurs on the carboniferous limestones of the West of England, as at the Great Orme's Head and St. Vincent's Rocks, and again in Norfolk.

Radnor Forest consists of a considerable area of low hills, none more than 2166 feet in height; they are clothed with short grass, *Pteris aquilina*, *Lastrea Oreopteris*, *Ulex Gallii*, *Vaccinium Myrtillus*, &c., and quite bare of trees, except for a few larch plantations; they are composed of Upper Silurian rocks. The remainder of the country over which I collected was Lower Silurian, except at Builth, where the Carneddau range is composed of volcanic grits. The following plants, abundant in the neighbouring county of Hereford, were remarkable for their rarity or absence:—*Symphytum officinale*, *Centaurea Scabiosa*, *Tanacetum vulgare*, *Viscum album*, and *Linaria minor:* of these, *Tanacetum vulgare* was the only one I actually saw; but it must be remembered that my excursions were limited, and by no means exhaust the flora of the southern parts to which I chiefly turned my attention.

I will now give a list of the more interesting plants met with, most of which have not been previously recorded as occurring in this county.

Ranunculus Lenormandi, F. Schultz. In a stream near Painscastle.

R. Flammula, L. Streams in the Radnor Forest. Abundant.

R. auricomus, L. In a copse near Aberedw.

R. arvensis, L. In the cornfields about Clyro.

Fumaria confusa, Jord. In a potato field near the railway, Aberedw.

Cardamine impatiens, L. A rocky wood on the left bank of the River Edw, at Aberedw.

Arabis hirsuta, Br. New Radnor, and between Builth Wells Station and Llanellwedd, on walls.

Lepidium campestre, Br. Roadside near Builth.

L. Smithii, Hook. On the Stanner Rocks. On rubbish heaps by the side of the road between Clyro and Painscastle.

Viola tricolor, L. With purple flowers, Aberedw Hill. With yellow flowers, cornfields.

V. arvensis, Murr. Cornfields.

V. lutea, L. Above Water-break-its-Neck Waterfall, about a mile from New Radnor.

Dianthus deltoides, L. Mount Carneddau, not far from a farm-house, but without doubt native.

Stellaria aquatica, Scop. Near Clyro. In a stream between Dolyhir and New Radnor.

Spergula arvensis, L. Cornfields about Clyro; and Gaer, near Llansaintfread.

Scleranthus perennis, L. Is still to be found in the well-known locality, viz., at the foot of the Stanner Rocks, but is by no means abundant there.

Hypericum tetrapterum, Fries. In marshes on the hills above Llanelwedd.

H. humifusum, L. On the Stanner Rocks, east side, and by the side of the road between Builth and Aberedw.

Malva moschata, L. Is very abundant about the roadsides and elsewhere.

Geranium pratense, L. In the hedges between Llanbadan and Aberedw; and on the Aberedw Mountain.

G. molle, L. Aberedw; and above the stream Edw, together with *G. pusillum*, L.

G. columbinum, L. By the side of the road running through Aberedw village.

G. lucidum, L. At Water-break-its-Neck fall; among the stones in Aberedw churchyard.

Ulex Gallii, Planch. Hillsides. Spread over a large extent of country in the Radnor Forest and Aberedw mountains.

Genista tinctoria, L. A few plants near Gaer.

Trifolium medium, L. Roadside near Clyro.

T. filiforme, L. Road near Clyro.

Agrimonia odorata, Mill. On the bank of a stream at Gaer, near Llansaintfread.

Poterium Sanguisorba, L. Roadside, Llanelwedd.

Alchemilla vulgaris, L. Fields and hilly places, Radnor Forest.

Rosa spinosissima, L. Stanner Rocks.

Pyrus Aria, Hook. Aberedw Rocks, above the railway.

P. Aucuparia, Gaert. Aberedw Woods and Mountain. I believe it to be truly wild here, though in many other localities it has certainly been introduced. It seems widely scattered over the low mountains of this part of Wales, occurring also in Breconshire on Mynydd Troed and other mountains.

Peplis Portula, L. Rhos Common. In a little pool on Llandeilo Hill.

Epilobium angustifolium, L. Native on Rhos Common. It has

been planted or escaped in many other places in Radnorshire, especially about the railway banks.

Circæa intermedia, Ehrh. Among loose stones, on the Aberedw Mountain, between Aberedw and Llandeilo Hill. The plant appears to me identical with specimens marked as true *C. intermedia* by Ascherson in the British Museum Herbarium.

Bryonia dioica, L. Roadside near Radnor. Not common.

Sedum Telephium, L., var. *Fabaria*. Abundant on the Carneddau mountains, above the road from Builth to Aberedw. A few plants also occurred on the Stanner Rocks.

Cotyledon Umbilicus, L. Stanner Rocks; roadside, Clyro, on a wall. Only one or two plants in each locality. This scarcity is remarkable when the great abundance of the plant in the neighbouring county of Herefordshire is contrasted with it.

Cicuta virosa, L. Rhos Common; in a stream on Mount Carneddau.

Oenanthe crocata, L. Rhos Goch; Aberedw, near the River Edw.

Silaus pratensis, L. Radnor Forest.

Asperula odorata, L. Bushy places near Clyro. Woods, Aberedw.

Dipsacus pilosus, L. Thickets on the right bank of the River Edw. Aberedw, near the railway.

Carlina vulgaris, L. Stanner Hill; Carneddau Mountain; Aberedw Hills.

Serratula tinctoria, L. Foot of the Stanner Rocks.

Matricaria inodora, L. By the roadside, Painscastle.

Tanacetum vulgare, L. A single plant on the road to New Radnor, near Dolyhir; certainly far less abundant than in Herefordshire.

Artemisia Absinthium, L. Occurs, doubtless as an escape, on the roadside near Rhos Goch Mill.

Senecio sylvaticus, L. Hills above the road from Aberedw to Builth.

Lactuca muralis, Fresen. Bushy places near Clyro.

Jasione montana, L. Stanner Rocks.

Campanula rapunculoides, L. On the side of the road near New Radnor, probably escaped.

C. latifolia, L. In a wood on the banks of the Edw, Aberedw.

C. patula, L. One specimen, roadside near Clyro.

Calluna vulgaris, Salisb. Radnor Forest. Rhos Common.

Solanum Dulcamara, L. Near Llanelwedd, on the road to Aberedw.

Veronica montana, L. Stanner Rocks. Aberedw Mountain.

V. hybrida, L. Stanner Rocks, south side, sparingly.

Pedicularis palustris, L. Rhos Common.

Origanum vulgare, L. Foot of Stanner Hill.

Scutellaria minor, L. In a bog, Carneddau Mountain.

Stachys Betonica, Benth. Roadside near the village of Clyro; near Llanelwedd.

Galeopsis Ladanum, L. Roadside near Llanelwedd.

Myosotis palustris, With. A few specimens on Rhos Common.

Utricularia vulgaris, L., and *U. minor*, L. In peat pools on Rhos Common.

Empetrum nigrum, L. Radnor Forest; on the mountains Whimble and Foel.

Sparganium ramosum, Huds. Ditches on Rhos Common.

Potamogeton natans, L., and *P. crispus*, L. Peat pools, Rhos Common.

Triglochin palustre, L. Rhos Common.

Neottia Nidus-avis, Rich. Wood above the Edw, near Aberedw.

Tamus communis, L. Roadsides between Llanelwedd and Aberedw; and between Dolyhir and New Radnor.

Allium ursinum, L. Wood on the left bank of the River Edw, near Aberedw.

Narthecium Ossifragum, Huds. Bogs, Carneddau Mountain.

Luzula sylvatica, Bich. Aberedw Woods.

L. multiflora, var. *congesta*, Koch. Bogs, Carneddau Mountain.

Juncus conglomeratus, L. Marshes near Painscastle.

J. obtusiflorus, Ehrh.; *J. acutiflorus*, Ehrh.; *J. bufonius*, L.: Rhos Common; marshy ground between Clyro and Rhos Goch.

J. squarrosus, L. Bog, Carneddau Mountain.

Scirpus palustris, L. Rhos Common.

S. pauciflorus, Lightf. Rhos Common.

Eriophorum angustifolium, Roth. Rhos Common.

E. angustifolium, var. *minus*. Bog, Carneddau Mountain.

Carex paniculata, L. Carneddau Bog.

C. stellulata, L. Stanner Hill. Marshes above the road to Aberedw from Builth.

C. remota, L. Aberedw Woods.

C. ovalis, Good. Carneddau Bogs.

C. flava, L. Stanner Hill.

Alopecurus geniculatus, L. Stream on Carneddan Mountain.

Arundo Phragmites, Trin. Rhos Common.

Melica uniflora, Retz. Foot of Stanner Hill.

Glyceria fluitans, Br. Streams, Carneddau. Rhos Common.

Festuca ovina, L. Widely distributed over the Carneddau and Radnor Forest Hills.

Bromus asper, Murr. Aberedw Woods; woods above Llanfaredd.

B. sterilis, L. Roadside between Builth and Aberedw.

Nardus stricta, L. Bogs, Carneddau Mountain.

Lomaria Spicant, Desv. Hillside, Radnor Forest.

Scolopendrium vulgare, Sm. Apparently very local; in one spot in Aberedw Woods.

Asplenium Ruta-muraria, L. Walls, New Radnor.

A. Trichomanes, L. Water-break-its-Neck, on the rocks on both sides of the cascade.

A. Adiantum-nigrum, L. Stanner Rocks; Water-break-its-Neck, on the rocks on both sides of the cascade; rocky places above the road from Builth to Aberedw, near Llanelwedd.

Cystopteris fragilis, Bernh. On a shed in a farmyard near Water-break-its-Neck, and on the rocks near the fall. Var. *dentata*. Aberedw Woods, in the dry bed of a stream.

Aspidium aculeatum, Sw. Banks of the Edw.

Nephrodium dilatatum, Desv. Woods near Llanfaredd and Aberedw.

Osmunda regalis, L. Rhos Common, on the edges of peat pools.

Equisetum sylvaticum, L. Near Painscastle.

E. limosum, L. Rhos Common.

SHORT NOTES.

THLASPI ALPESTRE, L., IN SOMERSETSHIRE.—The Rev. R. P. Murray has brought to the British Museum Herbarium a specimen of the above-named plant, collected by him on the 5th ult., between Shipham and Rowberrow, near Axbridge, Somerset, growing among herbage on a bank by the roadside, on mountain limestone. This extends the range of the plant, of which Glamorgan was previously the southern limit.—JAMES BRITTEN.

LESCURÆA MUTABILIS, Ferg.—At p. 114 I stated that the *Lescuræa* from Ben Lawers was not Schimper's variety *saxicola*, but the type. This view was expressed after comparison with very few specimens, and after learning the opinion of a bryologist of ten times my experience. It has now been examined, and compared with authentic specimens by Dr. Braithwaite and Mr. E. M. Holmes, and they both refer it without doubt to Schimper's variety *saxicola*. This variety is regarded by Molendo, Milde, Lindberg, and Braithwaite as a species. Mr. Holmes has kindly sent me a note to make use of in this correction. He says:—"*Lescuræa mutabilis*, Fergusson . . . A specimen of a moss forwarded to me under the above name for exhibition at a recent meeting of the Linnean Society proved on examination to be *L. saxicola* of Milde—*L. striata*, Br. & Sch., var. *saxicola* of Schimper's Synopsis. This variety is distinguished from the typical plant by its longer stems more regularly pinnate at the extremity, by its larger and broader subsecund leaves, more shortly acuminate and serrate at the apex, and by its yellowish brown colour. It also grows on stones on mountains, more particularly of the northern zone, where, according to Schimper, the typical plant is rare, the habitat of the latter being on the branches and twigs of dwarf shrubby beeches on the loftier mountains of the middle and southern zone, from the Alps to the Jura. In such situations it usually grows with *Brachythecium reflexum*. From *Pterigynandrum filiforme*, *Lescuræa saxicola* is distinguished at sight by its striated leaves, and under the microscope by the nerve which almost reaches the apex of the

leaf. In the herbarium at Kew a specimen of the rare plant occurs, collected by Don in Scotland; but some of the localities he gives for other plants being regarded as doubtful, his discovery does not appear to have been published."—W. West.

Spring-flowering Form of Colchicum autumnale [see Journ. Bot., 1880, pp. 145, 185].—I think it should be put on record that the Colchicum plants which flowered in the early spring of last year in two habitats near Bristol have resumed their normal condition. This season there has not been found a single flowering specimen. It appears to me that the explanatory hypothesis offered at p. 145 of last year's Journal was a new one. The function of the plants was temporarily disordered by the rigorous autumnal frosts of 1879; and climatic influences in the following season being no longer adverse, they have been enabled to fulfil their natural economy.—Jas. W. White.

Notes on Report of Botanical Exchange Club for 1879.—*Cardamine dentata*, Schultz. This plant occurs abundantly, and is the only form, in wet meadows by a tributary of the Stour, west of Herne Bridge Station, near Christchurch, Hants.—*Herniaria hirsuta*, L. In December last I visited the locality where I had found this plant in June, 1879. [See Journ. Bot., 1880, p. 51.] It occurs in plenty over about an acre of ground, being part of a large field, portions of which have been let to different persons for the cultivation of various crops. The acre in question had been out of cultivation for about three years, and I was informed the last crop was potatoes. I could not find the plant in other portions of the field, and until it has been found elsewhere its position as an indigenous species must, I think, be held with suspicion.—*Vulpia ciliata*, Link., var. *glabra* (*Festuca ambigua*, Le Gall.) A notice of this plant having been found by me in Suffolk in 1846, and again by Mr. Bennett in 1879, will be found in 'Journal of Botany' for 1879, p. 195.—*Ophioglossum vulgatum*, L., var. *ambiguum*, Coss. & Germ. The first published record of this variety as an English plant was in my 'Contributions to a Flora of the Scilly Isles,' published in this Journal for 1864 (p. 120), and I distributed specimens at the time. Dr. J. T. Boswell states, in Eng. Bot., ed. iii. (1870), that he had found it in Orkney seventeen years before.—F. Townsend.

Tulipa sylvestris, Linn., in flower.—Whilst botanising about Harefield, Middlesex, on May 7th, a fine specimen of the above was found by my sister in the grove behind the church, and, on carefully searching, three more flowering specimens were discovered, but all, except the first, more or less withered. The locality is a well-known one, but I believe the plant is so seldom met with in

the flowering state that the above record may be of interest. *Dentaria* was flowering in profusion, and at Pinner we found the *Fritillaria* still abundant in one meadow.—Frederick J. Hanbury.

Silicified Trees.—[Dr. Otto Kuntze requests us to insert the following note referring to the notice of his paper 'Uber Geysirs,' &c., at p. 27 of this Journal.] "Petrified trees have originated from stems which were (1) sunk erect in the mud of the sea (2) gradually covered by sediment; and (3) when these have disappeared by decay (4) the hollow of the stem has been filled with sediment. The silicification of trees *in situ* by capillarity is not the mode in which they may become silicified; and I myself mention in my paper another mode of the silicification of leaves, branches, small stems, and fruits in the neighbourhood of geysirs and hot springs. Lyell's hypothesis is not confirmed by facts which I have observed; for all silicified trees which I have seen are silicified equally all round. Heavy showers occurring to trees on the lee-ward side of geysirs would cause a partial silicification of one side only; besides which, it is stated that the bark of the trees cannot be pene-trated by the silica-holding hot water of the geysirs."—O. Kuntze.

Introduced European Plants in Chile.—Mr. Thomas King writes as follows in the 'Proceedings of the Natural History Society of Glasgow,' vol. iv., part i., p. 44 (1880):—"Our com-mon Bindweed (*Convolvulus arvensis*) is now one of the worst Chilian weeds. *Mentha piperita* and *M. citrata*, the *Yerbabuena* of the Chilenos, were introduced by the Spaniards to season their dishes, and are now found in every damp place in the country. Hemlock (*Conium maculatum*), now so common that it is used to thatch booths, comes from a few seeds which an apothecary had sent to him from Spain fifty or sixty years ago. *Trifolium repens* is now common on the hills behind Valparaiso; *Viola odorata* grows by the sides of streams, and little boys sell bunches of them in the streets. I saw the Dandelion for the first time in June, 1872. Dr. Philippe had seen it six months earlier, but by December I saw it growing in the streets of Santiago. I tried to introduce the Field Daisy (*Bellis perennis*), and got some seed sent me from the West-end Park. It grew well enough and flowered, but did not spread. I suppose it is extinct by this time. But the most remarkable introduction of all is perhaps the Cardon (*Cynara Car-dunculus*), a plant from the south of Europe. It now covers large tracts in Chile, and is, I believe, the same thistle that has overrun the plains of the Argentine Republic."

Extracts and Notices of Books and Memoirs.

THE PROPOSED REMOVAL OF THE BOTANICAL COLLECTIONS OF THE FLORENCE MUSEUM.

[We have received the following letter from Mr. John Ball, F.R.S., enclosing a translation of a memorial recently circulated and signed by Italian botanists of eminence. The letter and memorial speak for themselves; and we gladly give to them such publicity as the pages of this Journal can afford.—Ed. Journ. Bot.]

"I think that you will render a service to the interests of Botanical Science by publishing the enclosed protest of the botanists of Florence against the proposed removal of the Herbarium and annexed Botanic Garden in that city. The Herbarium is not only one of the richest in Europe, but is of exceptional importance, from the fact that in the collections bequeathed by the late Mr. Barker Webb are included the type specimens of the Canarian Flora and of his other works, as well as those of the classical works of Desfontaines, Labillardière, and Ruiz and Pavon, whose Herbaria all passed into his hands. The building in which it is lodged is admirably adapted for the purpose, while the site to which it is proposed to remove is in all respects objectionable, and would entail the certain injury and probable loss of these priceless collections.—John Ball."

When, in the month of May, 1874, botanists from all parts of the world were assembled in Florence in the building containing the Botanical Museum founded by the late Professor Parlatore, Monsieur Alphonse DeCandolle, in presiding over the first meeting, observed "that one of the most remarkable objects calling for the attention of the Congress was the Botanical Museum, with the spacious and convenient halls and galleries in which its meetings were held."

No one at that time would have supposed that what excited the admiration of the most competent judges would have been condemned and sentenced to destruction only seven years after these emphatic words were pronounced. To justify the abandonment of the present museum, the only plausible reason alleged is the inconvenience to the students attending the lectures of the Institute of Higher Studies in the Piazza San Marco, in having to go so far as the museum in Via Romana in order to follow the lectures given there; and, with a view to centralise the buildings devoted to students, nothing less is proposed than to transport all the botanical collections, and to abandon the garden attached to the present museum, with its hothouses and other appurtenances. In return, it is proposed to restore to its old destination the small ancient *Garden of Simples* adjoining the building, where it is proposed to lodge the herbarium. But the question which requires consideration is how far the proposed arrangements are conducive

to the safety and good preservation of the collections, and how far the new localities proposed are suited for the intended purpose.

The building proposed to receive the Herbarium was formerly used as the stables of the Grand Dukes of Tuscany, and more recently occupied by the cavalry of the Italian army. For three hundred years it has been constantly occupied by a large number of horses, and it is in this building that it is now proposed to lodge the priceless collections of dried plants that form the National Herbarium, so peculiarly liable to injury from damp. It is true that with a very heavy outlay that would be necessary for the rebuilding of a great part of the present structure, it might be possible to eradicate the effects of the long usage to which it has been applied; but, even if this were done, it may be doubted whether there is any chance of obtaining a building comparable in beauty, convenience, and suitability to its intended purpose as the present museum.

The project in question supported by influential men personally worthy of respect, but having no familiarity with botanical science, and therefore not competent judges, appearing to be on the verge of final adoption, the undersigned residents in Florence interested in botanical studies think it their duty to protest against the proposed removal of the museum; and to give more weight to their protest, they invite all the botanists who were present at the Congress of 1874, as well as all others who are personally acquainted with the museum, to join us in endeavouring to prevent the execution of a project which we believe to be highly injurious to the branch of natural science to which we are devoted.

We, therefore, address ourselves to the botanists of all countries, to request they will use their influence to obtain the abandonment of the projected removal of the National Museum, and the application of the large sum required for that purpose, or a sufficient portion of it, to the further improvement of the present collections, by the purchase of living or dried plants (especially cryptogams), to supplying deficiencies in the botanical library, to providing additional cases for dried plants now inaccessible for want of space in which to arrange them, and, finally, to the repairs and improvements urgently needed in the plant-houses of the Botanical Garden.

NOTE ON MR. J. THOMSON'S CENTRAL AFRICAN COLLECTION.

[We are indebted to Mr. Baker for the following note, which he has drawn up for Mr. Thomson's recent work, 'To the Central African Lakes and back.' Mr. Baker has kindly added diagnoses of the two new species indicated in the note.—Ed. Journ. Bot.]

The collection contains altogether nearly 200 species. Amongst the plants from an elevation of 6000 to 8000 feet are a certain number of characteristically Cape types. Amongst these are *Dierama* (Sparaxis) *pendula*, a common Cape plant long known in English gardens; *Buphane toxicaria*, the well-known "poison-bulb"

of Natal and the Transvaal, which was found also by Captain Cameron on the shores of Lake Tanganika, and by Welwitsch in Angola; *Silene Burchellii*, *Clematis Thunbergii*, *Hypoxis villosa* and *obtusa*, *Berkheya Zeyheri*, *Dombeya Burgessiæ* and *Plectronia Gueinzii* of Natal, *Ascolepis capensis*, and *Alepidea anatymbica*. There are a considerable number of characteristically Cape genera, of which one or more species, not identical with those of the Cape, are found in Abyssinia or other regions of Central Africa. These are represented in Mr. Thomson's collection by a *Protea*, probably conspecific with *abyssinica*, a *Pelargonium*, two species of *Selago*, *Moræa diversifolia*, *Felicia abyssinica* and a second species, three species of *Helichrysum*, *Lightfootia abyssinica*, and a second species apparently new, two Gnidias, a *Cluytia*, *Rhus glaucescens*, two Disas, and a new *Gladiolus* of the section *Hebea*. Of widely-spread temperate types we have *Scabiosa Columbaria*, a common British plant, a *Cerastium*, a *Hypericum*, *Solanum nigrum*, a *Lotus*, and a *Calamintha*. *Agauria salicifolia* and *Geranium simense*, both of which Mr. Thomson has gathered, are common to the Cameroons and the mountains of Abyssinia and Madagascar. *Caucalis melanantha* is common to the mountains of Abyssinia and Madagascar, and *Rumex maderensis*, which was also gathered by Speke and Grant, is a plant of the Atlantic Islands. The greater proportion of the collection from the lower levels consists of species of widely-spread tropical and subtemperate genera, some of which are confined to the old world, whilst others belt the whole globe in the warmer zones. To this class belong a new tree-fern of the genus *Cyathea* (*C. Thomsoni*, Baker, MSS.), a new scapigerous *Torenia* near *T. Schweinfurthii*, a new *Tecoma* (*T. Nyassæ*, Oliver, in Hooker's 'Icones,' t. 1351), *Margaretta rosea*, the only known species of a genus discovered by Colonel Grant, and named after Mrs. Grant, *Euphorbia Grantii* (Oliver), a curious broad-leaved species with very large hand-like glands to the involucre, *Pavonia Schimperiana*, a *Mimulopsis*, a *Burmannia*, an *Eriocaulon*, a *Triumfetta*, two Ochnas, a *Crotalaria*, four Indigoferas, a *Tephrosia*, a *Smithia*, a *Cassia*, a *Combretum*, a very fine *Loranthus*, with broad leaves and tubular flowers densely clothed with yellow hairs, a *Spermacoce*, eleven Vernonias, three Buchneras, five Ipomæas, an *Acalypha*, three Ocymums, and three species of *Plectranthus*. Universally diffused tropical species are represented in the collection by *Dodonæa viscosa* and *Bidens pilosa*. The specimens are deposited in the herbarium of the Royal Gardens at Kew, and have nearly all been examined and determined by Professor Oliver.

Gladiolus (Hebea) Thomsoni, Baker, n. sp.---Bulb and root-leaves not collected. Stem short, slender, glabrous. Spike secund, rather lax, 4–6 in. long; outer spathe-valve deltoid-cuspidate, brownish, veined, moderately firm in texture; inner rather shorter, oblong, membranous. Whole flower under an inch long, bright red; ovary oblong, $\frac{1}{8}$ in.; tube $\frac{1}{4}$ in.; and upper segments of the limb $\frac{1}{4}$–$\frac{1}{3}$ in. broad, oblong, subacute, cuneate at the base; three lower oblanceolate-unguiculate, $\frac{1}{8}$ in. broad, acute, with a claw about as long as the lamina. Stamens $\frac{1}{2}$ in. long, falling rather

short of the tip of the upper segments; anthers as long as the filaments. Style reaching as high as the top of the anthers; branches falcate, cuneate, with a stalk as long as the stigmatose portion.—Upper plateau of Lake Nyassa.—Allied to *G. pulchellus* and *G. formosus* of the Cape.

Cyathea Thomsoni, Baker, n. sp.—Frond ample, decompound, tripinnatifid, dull green, upper surface glabrescent, lower hairy all over. Pinnæ lanceolate, 15–18 in. long, 3½–4 in. broad, their rachis pale dull brown, densely furfuraceous above, slightly so on the under side. Pinnules lanceolate, sessile, ½–2 in. long, ⅓ in. broad, cut down to a broad wing into oblong entire tertiary segments ⅛ in. broad. Veins pinnate in the tertiary segments; veinlets 9–8-jugate, forked. Sori costular. Involucre large, fragile, breaking up irregularly.—Lower plateaux round Lake Nyassa.—Near *C. Dregei*, differing in its pilose frond, and involucre breaking up irregularly, &c.

Guide to the Literature of Botany; being a classified selection of Botanical Works, including nearly 6000 *Titles not given in Pritzel's 'Thesaurus.'* By Benjamin Daydon Jackson, Secretary of the Linnean Society. London: published for the Index Society. Longmans; Dulau and Co. 1881.

In this handsome volume of more than 650 pages we have the results of a long and laborious undertaking—results which have ended in the production of an indispensable companion to botanical literature. Those who know the conscientious care with which Mr. Jackson has laboured—we use the word advisedly—at this 'Guide' will find in its completion a double cause for congratulation; they will congratulate the author upon the completion of his task, and they will also felicitate those for whose benefit the task was undertaken.

The title-page of the work suggests at once the idea of an undertaking of considerable difficulty: an examination of its contents will show how well the author has attained his object. Mr. Jackson tells us:—"The 'Guide' is meant to be suggestive, not exhaustive; it does not claim to be a complete bibliography of the subject, but to indicate the general drift of the 9000 and odd books enumerated." With respect to the main principles that have guided him in his selection he says:—"The aim I set before myself was to give all the works likely to be wanted by my fellow-countrymen, either for a knowledge of their own botanical literature, local and colonial floras, or for trade; keeping specially in view those districts likely to be visited by the traveller from these shores." There is, however, much in the 'Guide' beyond these somewhat narrow limits. The classification of the list is without doubt a great advantage, and well worth the trouble that has been spent upon it, though this has been so great that the author declares:—"I would never again attempt a catalogue which was primarily a classified list."

The general account of the scope of the work, from which we have made the above quotations, contains also an explanation of the contractions used, the method pursued with respect to "translations or transliterations from Russ, Greek, and other languages not using the Roman letters," with several amusing illustrations of difficulties and ambiguities that have arisen from the whims and eccentricities of authors, forming an interesting Preface of twenty-six pages. This is followed by a brief Historical Introduction of thirteen pages, which is remarkably concise—more so, indeed, than we could have wished; the unfortunate "Arabs," for example, though they, for three hundred years as we are told, "alone bore the lighted torch of learning, and to them Western nations owe a deep debt of gratitude, for the discovery of many species and drugs of vegetable origin," are despatched from first to last in ten lines, and are heard of no more excepting in the Index.

The 'Guide' is founded on Pritzell's 'Thesaurus,' to which, as we have seen from the title-page, many additions have been made. Many of these, as examination will show, are additions of considerable importance, of works published before 1870; of a great number that have appeared since that date; and of many which, though of great interest, do not appear to have fallen within the scope of Pritzel's intention. The list of publications is arranged in consecutive sections from 1 to 124. Many of these are grouped into divisions with much judgment, making reference easy, and also, it must be admitted, pointing out deficiencies to those who have studied any particular branch of Botany. The first nine sections are:—1. Bibliography; 2. History; 3. Biography, which "must be considered as strictly supplemental to Pritzel;" Indexes, in two sections, viz., 4. Terminology; 5. Plant Names—we miss here, by the way, the much used, if not quoted, 'Glossaire de Botanique,' by Alexandre de Théis, Paris, 1810; 6. Encyclopædias; 7. Keys to other books; 8. Nomenclators; 9. Systems. These nine sections occupy eighteen pages. Pre-Linnæan Botany follows in three sections: 10. Biblical Botany; 11. Classical Botany; 12. Early Modern (pp. 19–32). Perhaps Mr. Jackson has but exercised sound discretion in cutting this chapter short; but there are probably some readers who would desire more information than is to be found here. We have Theophrastus, Dioscorides, and Pliny, but of the last the English translation by Philemon Holland, and the translation by Bostock and Riley in Bohn's Library, which includes in its ample notes the researches of Fée and others, are not mentioned, though of interest to English students of botanical literature. Mr. Jackson remarks of Pliny, "his laborious compilations on plants have no original value whatever." This, however, is not the case with Cato and Varro. Perhaps if they were admitted, Virgil's Georgics and Columella's works would also have to find a place, and Paulus Ægineta, who is also unnoticed, though we have an English translation of his work, as well as the Aldine edition of 1528. We always meet with Apuleius, too, in botanical history, though his botanical work may not be of much consequence. It is true that information about all these—the originals,

not the translations—may be had from Lemprière; but even so much as this cannot be said with respect to the Arabic writers. A list of such of the works of these as have been translated into Latin is a desideratum. If we may form an opinion of the interest attaching to the early Natural History works, at the time when modern learning began, by the date of their appearance after the invention of printing, Serapion, who was published in 1473, is second only to Pliny in order. Besides Serapion, Razis, Avicenna, and Averroes, just mentioned by Mr. Jackson in his Historical Introduction, we meet with some other Arabic writers in our libraries, translated into Latin. Perhaps none of these old books would be of very general interest, but their introduction would not have occupied much space; it would have been useful to some readers, and the chapter would have been more complete if they had been there. Whether the "overhauling of the more than 2200 volumes of the [British] Museum Catalogue," which the author has not attempted, as he believes "the results would hardly be proportionate to the formidable task," would have supplied many interesting additions to this division there is no telling. 'Lonitzer (A.) Kreuterbuch, Frankfurt, 1557,' appears, but his 'Naturalis Historiæ Opus novum, 1551,' is not noticed.

After Pre-Linnean Botany are Introductory Works (§ 13–15, p. 33–66), a great number of which are recent, published since 1870; Physiological and Morphological Botany (§ 16–43, p. 67–109). Descriptive Botany (§ 44–55, p. 110–175); Paleobotany (§ 56–57, p. 175–191); Economic Botany (§ 58–66, p. 191–211). These divisions, with their several sections, are very clearly arranged, so that the inquirer may find without difficulty in one place the literature of any particular branch that he may want. For instance, Cryptogamic Botany has received much attention of late; here are § 49. Ferns; 50. Mosses; 51. Hepaticæ; 52. Characeæ; 53. Algæ, Desmids, and Diatoms; 54. Lichens; 55. Fungi. Again, Economic Botany is generally supposed to be rather a neglected branch of the science; but a reference to this division will disclose such a number of works on the subject as to prove that it has received its full share of attention. We find the following sections:—58. General Works; 59. Food-plants; Grain, Forage, Food-plants of Insects; 60. Luxuries; Sugar-yielding Plants; 61. Medicinal Plants; 62. Dendrology; 63. Textile Plants; 64. Perfumery; 65. Dye Stuffs, &c., Tanning Materials, Gums, Starches; 66. Weeds.

With respect to the classification of the titles some difficulties are apparent. As the author points out, "many books treating of several departments of Botany might fitly have gone in several sections," and though this has been generally avoided, in a few cases books are placed in more than one. In some instances this plan might probably have been extended with advantage. Again, the author says:—"As titles are often insufficient and even misguiding, I may have placed some books in sections different from those I might have chosen had I been able to refer to the books themselves." Many of these would no doubt be altered in a second

edition. For instance, we find on p. 77, § 17, "The Cell and Cell Contents," and the paragraph, or sub-section, "Crystals, &c." Under this is placed "Donders (F. C.) Der Stoffwechsel, als Quelle der Eigenwaerme bei Pflanzen und Thieren. Wiesbaden, 1847. 8°." This work would be more at home in "§ 18. Nutrition and Vitality"—say next to Thorey's "Beitrag zur Lehre vom Pflanzlichen Stoffwechsel," on the same page, or even more so next to Schmitz's work, 'Ueber die Eigenwaerme des Pflanzen,' on p. 78.

After Economic Botany follow Emblematic Works; Practical Botany; Local Works, under the three sections, Directories, Geographical Distribution, Voyages; and then Local Floras, which is the largest, if not the most important division in the book (pp. 225–495). It seems to be very complete, and gives a comprehensive collection of "Floras" of all parts of the world, in the mass and in detail; thus, after looking over the Floras of Europe, we may pass on successively to those of Great Britain, of England, of Middlesex, and of London; and it is the same with the other quarters of the globe, so far as there is material, and the material is very abundant. The division Botanical Gardens (pp. 405–453) is arranged in a similar manner to the last, and supplies a list of works in reference to them in all parts of the world from Gerard's Catalogus (1596), the earliest published garden catalogue, to Seboth's Alpine Plants painted from Nature, 1880.

Serial Publications occupy thirty pages, divided into two sections, Transactions and Journals. The first of these, occupying eighteen pages, is all but new; for out of the 267 publications included in it, only fourteen are given in Pritzel. Of the 160 Journals, sixty-three are given in Pritzel. It may be noticed that all the works in the list of Serial Publications for America and Canada are supplementary to the 'Thesaurus.' We think it would have been to Mr. Jackson's advantage had he obtained the co operation of some American botanist. It is almost certain that many American books of the popular order must be in existence which an American botanist would be acquainted with; just as there are numberless works of this kind published in England which are not likely to cross the Atlantic. A search through the files of botanical periodicals alone would have yielded additions: as an instance of this we notice in the 'Bulletin' of the Torrey Botanical Club (begun in 1870) notices of works omitted by Mr. Jackson.

"The Addenda includes the titles of such books as came to hand too late for incorporation in their proper places, new publications, and a few which had been accidentally misplaced." These are classified in sections corresponding in name and number with those of the main portion of the book, and bring the work down to the end of 1880.

The Index is extensive, occupying 111 pages, and as complete and accurate probably as is in the nature of indexes. Trifling slips seem inevitable to them. Thus the Epitome of Camerarius (p. 27), has somehow found no place in the Index; Lankester's translation of Schleiden's 'Grundriss' is not found under Lankester, though it

is under Schleiden as "Principles." Besides being of the fullest character as to references, and at the same time as succinct in terms as clearness would allow, the Index has the merit also of supplying us directly with some useful information. The years of birth and death of deceased writers are included in parentheses when known to the author; if of birth or death only, the distinctive initial is prefixed. This useful feature might have been even more fully carried out; several additional dates may be gleaned from the volumes of this Journal. In the secondary but not unimportant characters of convenient size, clear type, and ample margin the volume leaves nothing to be desired.

On one or two minor points there is room for a difference of opinion. "The plan of spelling out the common diphthongs and modified vowels," to which we are becoming accustomed in Latin, looks odd when applied to German words. Mr. Jackson, however, is "quite ready to defend" what he considers as "merely a common-sense practice;" and he is probably right in saying that any objections made to it arise from want of familiarity with this mode of writing. His use—or rather disuse—of capitals in the titles of books is a little strange. 'Flora bathoniensis' and 'Flora bristoliensis' look odd to English eyes, although this may be the correct Latin form. When we remember that the work was originally expected to consist of about two hundred pages, we shall not complain that the Christian names of the authors are not given instead of their initials. In many instances this might have been done without occupying additional space; but Mr. Jackson has chosen, for the sake of uniformity, to omit them altogether from the body of the book, although some are given in the admirable Index.

The "Monographs" to which § 46 is devoted are of a miscellaneous character, including works descriptive of orders, genera, species, and even hybrids. Mr. Jackson seems to have expected some adverse criticism upon this section, and has in his Preface endeavoured to forestal it. It is indeed not easy to suggest an improvement; but we think something might have been done in the way of cross-reference. For instance, under the heading of an order, one might find some reference to the genera belonging to it which appear under a separate heading—*e. g.*, under *Orchideæ* might have been added "see also *Odontoglossum*;" while one is surprised at first to find no allusion to the *Crassulaceæ*, which form an important part of DeCandolle's 'Plantes Grasses,' that work being placed under the heading "*Cactaceæ*, &c." Wade's paper, '*De Buddlea globosa et Holco odorato*,' is found under the former genus only; there should at least have been a cross-reference under *Holcus*: and the same treatment should have been bestowed upon Baillon's 'Buxacées et Stylocerées,' which is referred to only under the former name. Under "*Orchidaceæ*" we should have expected a cross-reference to Bateman's 'Orchidaceæ of Mexico and Guatemala," which is placed in the section devoted to Central American Botany.

We would especially urge upon all who wish to use the book in

the most advantageous manner to read carefully the author's Preface,—a useful practice too often neglected,—and to remember that the works which they may expect to find are "books especially noteworthy," books given in Pritzel's 'Thesaurus,' ed. 2, but here corrected or added to, and books omitted by Pritzel; only such reprints as have separate pagination and a full title-page are included. Mr. Jackson's 'Remarks on Botanical Bibliography,' published in this Journal for 1880 (pp. 167–177), may be read with profit in connection with the 'Guide.' We imagine that many will regret that Mr. Jackson did not at once give us a new edition of Pritzel's 'Thesaurus;' he could certainly have done so with very little more labour than he has expended upon this work; but it would then hardly have come within the scope of the publications of the Index Society, to which body botanists are indebted for this most useful volume. We occasionally miss a distinctly noteworthy book—*e. g.*, Gaudichaud's 'Organogénie des Végétaux;' but on the whole Mr. Jackson has been singularly satisfactory in his selection of important books.

Much care has evidently been taken in ascertaining when possible the authors of anonymous or pseudonymous works; thus the "eminent botanist" who was advertised as having revised the second English edition of Figuier's 'Vegetable World' is identified with Mr. Dyer, of Kew; "Johannes Senilis," who is actually quoted under this pseudonym by the authors of the 'Genera Plantarum,' is shown to represent "J. Nelson;" and many other works of less note are traced to their authors. Further information in this direction will doubtless be forthcoming: *e. g.*, the little work 'Botany for Novices,' published under the initials "L. E. B.," was, we believe, written by Miss Lydia E. Becker.

This is an incomplete notice of a very complete book: but we trust that enough has been said to show that Mr. Jackson's 'Guide' is indispensable to every botanical library of any pretension, as well as to every general library in which botanical literature occupies a place.

R. H. A.

Botany of California. By Sereno Watson. Vol. II. [*Apetalæ—Sphagnaceæ.*] Cambridge, Mass., 1880.

The Flora of British India. By Sir J. D. Hooker, C.B., K.S.I. Part VIII. [*Rubiaceæ—Vaccinieæ.*] London: L. Reeve & Co. [1881.]

Biologia Centrali-Americana . . . . . Botany. By W. B. Hemsley. Part VII. April, 1881. [*Caprifoliaceæ—Compositæ* (part).]

The first two works named above are important contributions to our list of local floras, each of which may be taken as a type of what such works ought to be, except perhaps in one or two matters of detail to which we may hereafter allude. The first volume of the 'Botany of California' appeared in 1876, the authors undertaking it being Prof. Asa Gray, Mr. W. H. Brewer, and Dr. Sereno Watson; the

last-named botanist is the author of this the second and concluding volume, assisted in some families by "specialists of the highest authority in their several departments." The 'Flora of British India' is the latest and most flourishing of the series of colonial floras which have been subsidised by British or colonial governments, and which owe their existence and to a great extent their execution to the energy of Sir Joseph Hooker and his colleagues at Kew. We say "the most flourishing," because the progress of some of these floras has unfortunately been arrested. The last volume of the 'Flora Capensis,' for example, bears date 1864–1865, the *Campanulacea* being the last family described; the 'Flora of Tropical Africa' came to a standstill in 1877 with the *Ebenacea*; but the 'Flora of British India,' commenced in 1872, is steadily progressing, this progress being in no small degree owing to the energetic co-operation of Mr. C. B. Clarke.

The 'Botany of California' is a most attractive book; both paper and type seem to us as good as it is possible to procure, and the descriptions of the various groups leave nothing to be desired. Dr. Engelmann has undertaken the *Loranthacea* and *Abietinea*, as well as the genus *Quercus*; Mr. Bebb has elaborated the *Salices*; the *Carices* have been entrusted to Mr. William Boott (son, we believe, of the eminent caricologist), the Grasses to Dr. Thurber, and the Ferns to Prof. Eaton; the bulk of the work thus falling upon Dr. Sereno Watson, who is second only to Prof. Asa Gray in his devotedness to North American Botany, The greatest care is manifested upon every page, and nowhere perhaps more prominently than in the Index, which is a model of what such things should be. There is an Appendix consisting of a good glossary and an extremely interesting "List of persons who have made botanical collections in California," by Mr. Brewer; this title, however, hardly adequately conveys to the general reader how much information regarding those to whom we are mainly indebted for our knowledge of Californian Botany is given in this condensed account —from the time of Hænke, who collected in California in 1791, down to the present date.

A work of this kind is, of course, hardly suited for detailed criticism in these pages; but there are one or two points to which we would call attention. We note with pleasure that Dr. Watson, whom we have not previously encountered as a brycologist, names mosses on the principles generally adopted by phanerogamic botanists, but too often departed from by cryptogamists; so that we have only one authority for a given name, instead of two. On the other hand, we notice that such specific names as *californica*, *lapponica*, and the like are spelt with capital letters, which seems to us an undesirable innovation upon the recognised practice. In one respect—that of placing the name of the monographer of the order at the head of each page—we think our English colonial floras have the advantage: Dr. Watson's coadjutors do not put their names to the new species here described, and this may possibly mislead those who do not remember that the work is not all from one pen. Care must be taken to quote Mr. Boott's new

Carices as of W. Boott, not of Boott, or confusion will arise. When we consider the fragmentary manner in which the publication of American plants has been undertaken, and the difficulty of bringing together the scattered descriptions of genera and species from the reports, separate papers, catalogues, and journals in which they have appeared, we shall appreciate as it deserves this complete and readily consultable account of the Botany of California. We hope that Dr. Watson will now have time and opportunity to carry on his yet more generally useful work, the 'Bibliographical Index to North American Botany,' of which we anxiously await the completion.

The 'Flora of British India,' as represented in the part before us, is peculiarly open to criticism upon points of nomenclature, inasmuch as M. DeCandolle's "golden rule"—as Mr. Jackson has well styled it (Journ. Bot., 1881, p. 76)—"Never to make an author say what he has not said," is, unfortunately, by no means adhered to. In the single genus *Launæa* (pp. 415–417) we have the names of no less than five out of the seven species expressed as follows:—

L. asplenifolia, DC. Prodr., vii., 181 (*Microrhynchus*).
L. chondrilloides, DC. Prodr., vii., 183 (*Zollikoferia*).
L. secunda, Clarke Comp. Ind., 27 [276] (*Microrhynchus*).
L. nudicaulis, Less. Synops., 139 (*Microrhynchus*).
L. glomerata, Cassini in Dict. Sc. Nat., xlviii., 422 (*Lomatolepis*).

Future authors, if they wish to be correct, will cite Hook. f., Fl. Brit. Ind. as the authority for all these names. As if to mark more forcibly the inaccuracy of the citations given above, we find *Microrhynchus asplenifolius*, DC., *M. nudicaulis*, Less., and *Lomatolepis glomerata*, Cass., cited among the synonyms for the first, fourth, and fifth species respectively; thus making it appear that DeCandolle, Lessing, and Cassini gave two names to each plant. Nor can this mode of citation be defended on the plea of attributing the species to the author who first used the specific name retained; for the name *chondrilloides* was applied to the plant called *L. chondrilloides* above by Desfontaines (who called it *Sonchus chondrilloides*); the specific name of *L. nudicaulis* dates back to Linnæus (who called it *Chondrilla nudicaulis*), and so on. A yet worse form of this erroneous mode of citation is the following:—"*C*[*repis*] *glomerata*, Dcne in Jacq. Voy. Bot., 99, t. 107 (Prenanthes), not of Clarke. . . . *C. Hookeriana*, Clarke, Comp. Ind., 255." Future authors will of course cite *C. Hookeriana*, C. B. Clarke, which dates from 1876, as the proper name of the plant, in preference to *C. glomerata*, Hook. f. (1881).

Another instance of erroneous citation occurs on the opening page (p. 193) of the present part: "*S*[*aprosma*] *ternatum*, Hook. f., in Gen. Pl., ii., 131." There are two errors here; in the first place, no such name is to be found in the 'Genera Plantarum,' where we find only that "*Pæderia ternata*, Wall.," is placed in the genus *Saprosma*, but without specific name. To this point Mr. Jackson has already called attention. Secondly, although it is, we believe, quite true that Sir J. D. Hooker elaborated the *Rubiaceæ* for the 'Genera,' we find no published statement to this

effect in that work, and names contained in it must be quoted as of both authors—"Benth. & Hook. fil." Sir J. D. Hooker, in the work before us, is similarly not justified in citing "*P*[*luchea*] *lanceolata*, Oliv. Fl. Trop. Afr., iii., 272;" "O. & H." (Oliver and Hiern) is given in that book as the authority of the name. "*Crepis fuscipappa*, Benth., in Gen. Pl., ii., 574" [514] is another example of the double error referred to; made worse by the fact that the name is duly published by Mr. Clarke, who is therefore the authority for it, in his 'Compositæ Indicæ."

The bulk of the present part is occupied by the *Compositæ*, which have been elaborated by Sir Joseph Hooker, who has mainly followed upon the lines laid down in Mr. Clarke's 'Compositæ Indicæ," noticed in this Journal for 1876 (pp. 317, 318). We note in passing that our suspicions there expressed as to the erroneous identification of specimens of an English *Filago* with *F. arvensis*, L., are confirmed by Sir Joseph Hooker, who states that Mr. Clarke had "confounded it with *F. germanica*" in the work referred to. We find *Sonchus asper* and *S. oleraceus* retained as distinct species, although they are united in the 'Students' Flora,' with a note stating that Mr. Clarke observed "that in India [*S. asper*] flowers from December to April, and *S. oleraceus* from April to May" (p. 414). By a curious slip, *Centaurea Cyanus* is called at p. 384 "the common corn-cockle of England." We trust that nothing will occur to interrupt the steady progress of this very important flora.

Mr. Hemsley has commenced the second volume of his handsome work on Central American Botany, and we congratulate him upon the steady progress which he is making. In last year's 'Journal of Botany,' pp. 88–91, we criticised the beginning of the work at some length; and the present instalment of it shows that Mr. Hemsley may at least claim the merit of consistency, inasmuch as our criticisms of Parts I. and II. apply with equal force to the part now before us. We notice, however, that the references to any herbarium except that of Kew have entirely ceased; so that it becomes a question whether the work can claim to be more than a catalogue, with descriptions of some of the new species, of the Central American plants in the Kew collection—supplemented indeed by references to species described in books from that region, but with no attempt at completeness so far as the examination of other large herbaria is concerned. We abstain from repeating what we have already said at some length on this point; but we fail to understand why a large collection of Mexican plants, so readily accessible as that of Ruiz and Pavon in the National Herbarium at South Kensington, should be altogether passed over. Had that Herbarium been consulted in the most cursory way, the types of two species of *Psychotria* from Nicaragua—named by Dr. Seemann *P. cyanococca* and *P. chontalensis*, and published by him in Mr. W. Bull's 'Retail Catalogue' for 1870—would have received some mention; the former appears to be a very distinct species, and was figured in the 'Floral Magazine' (t. 479). J. B.

The 'Proceedings of the Royal Irish Academy' for April contains two interesting papers upon Irish Botany—one, 'On the Botany of the Galtee Mountains, Co. Tipperary,' by Mr. H. C. Hart, whose name is familiar to our readers; the other, 'On the Flora of the Blasket Islands, Co. Kerry,' by Mr. R. M. Barrington. Mr. Hart enumerates ten alpine plants as found upon the Galtees: —*Arabis petræa*, *Cochlearia officinalis*, var. *alpina*, *Sedum Rhodiola*. *Saxifraga stellaris*, *Hieracium anglicum*, *Saussurea alpina*, *Vaccinium Vitis-Idæa*, *Oxyria reniformis*, *Salix herbacea*, *Asplenium viride*; of these, the *Arabis* and *Saussurea*, as well as *Thalictrum minus*, *Polygala depressa*, *Pyrus Aucuparia*, and *Myosotis repens* are additions to District 2 of the 'Cybele Hibernica.' Mr. Barrington gives a comparative table of the plants found on five distinct groups of islands on the West Coast of Ireland. The areas of the five, with the number of species recorded from each, are as follow:—

	Acres.	Total Species.	Peculiar Species.
Arran Islands, Galway	10781	372	130
Aran Island, Donegal	4355	232	23
Inishbofin, Mayo	2312	303	36
Blaskets, Kerry	1560	174	8
Tay Island, Donegal	785	145	1

The papers upon Tay Island and Arran Island, on which the abstracts are based, will be found in this Journal for September, 1879, and January, 1881, respectively. The species peculiarto the Blaskets, as contrasted with the other groups, are:—*Cardamine sylvatica*, *Lychnis Githago*, *Stellaria graminea*, *Scilla nutans*, *Luzula sylvatica*, *Carex disticha*, *C. pilulifera*, *Hymenophyllum unilaterale*. One species, *Koeleria cristata*, is new to District 1 of the 'Cybele Hibernica.'

We have received from Messrs. Marshall Japp & Co., two little works, to which no writer's name is attached, entitled respectively 'Plant-life' and 'Easy Lessons in Botany.' The former consists of "popular papers on the phenomena of Botany," and does not materially differ from a large number of similar works prepared for general reading, and containing a somewhat miscellaneous assortment of facts. The illustrations are very poor. The other work is a much more satisfactory production, and is arranged so as to comply with the requirements of the Revised Code (1880). In forty-eight pages, with illustrations, more remarkable for quantity than quality, we have a plain and simple description of the parts of a plant, and a sketch of its structure—the numerous technical terms, some of which might have been omitted as unnecessary, being clearly explained in a few well-chosen words. Besides the class for whom it was especially prepared, this little book is well suited for placing in the hands of young gardeners as a prelude to more advanced works; and the few pence which it costs will be well spent upon a copy.

We are glad to see that in the last part (n. s., vol. iii., pt. 1), of the 'Proceedings of the Bristol Naturalists' Society' an increasing prominence is given to local observations. The principal botanical paper is a continuation of an enumeration of the Fungi of the Bristol district, by Mr. Cedric Bucknall. We note that the botanical section of the Society is working up the Botany of the district, with a view to the publication of a local 'Flora.'

The 'Report and Transactions of the Birmingham Natural History and Microscopical Society' for 1880 contains several botanical papers, by Mr. J. E. Bagnall and others, reprinted from the 'Midland Naturalist' of last year.

Articles in Journals.—April.

Archives des Sciences Physiques et Naturelles (15th April).—C. DeCandolle, 'On Phyllotaxy.'

Botanical Gazette.—J. T. Rothrock, 'On Modes of Work in Prof. de Bary's Laboratory.'—H. H. Rusby, 'On New Mexican Ferns.'—'W. K. Higley, 'Carnivorous Plants' (contd.)—M. E. Banning, 'Maryland Fungi.' 'Flora of Indiana (contd.)

Botanische Zeitung.—A. F. W. Schimper, 'Researches on the growth of Starch-granules' (concluded).—H. Vöchting, 'Memoir of Hanstein.'—G. Klebs, 'On the lower forms of *Algæ*' (2 tab.)

Botaniska Notiser.—P. Olsson, 'Flora of Jentland.'—E. J. Archong, '*Pelagophycus*, a new genus of *Laminarieæ*.'—C. Melander, 'Journey in Lappmark in the summer of 1880.'—F. Elving, 'Finnish Botanical Literature for 1873–79.'

Flora.—(March) G. Holzner, 'Agrostological Studies.'—J. Müller, 'Lichenological Contributions' (concluded).—F. Arnold, 'Lichenological Fragments' (contd.) — 'Botanical Society of Munich' (contains descriptions of *Hieracium latibracteatum*, n. hybr., Peter, and *H. rubrum*, Peter).—M. Gandoger, 'Salices novæ.'—(April) W. Behrens, 'Views of the Greeks and Romans on the Sexuality of Plants.'—A. Geheel, 'On Mosses collected by Breidler on the Austrian Alps' (*Didymodon styriacus*, Jur., n. sp.)

Hedwigia.—E. Rehm, 'Ascomycetæ,' fasc. xii. (concluded).—G. Winter, 'Fungi Helvetici novi.'

Journal of Linnean Society (Botany, vol. xviii., no. 111).—G. Watt, 'Notes on Vegetation of Chumba State and British Lahoul' (*Ranunculus pangiensis*, *Arabis pangiensis*, *A. bijuga*, *Androsace puncronifolia*, *Pedicularis eximia*, *Adiantum Wattii* (Baker), spp. nov., tt. 6.)—M. J. Berkeley, 'Australian Fungi' (*Inoderma*, gen. nov.)—P. MacOwan & H. Bolus, 'Novitates Capenses' (*Ranunculus Baurii*, MacOw.; *Crassula dependens*, Bolus; *Athrixia fontana*, MacOw.; *Senecio hullæfolius*, MacOw.; *Gazania cæspitosa*, Bolus; *Ericinella passerinoides*, Bolus; *Orthosiphon ambiguus*, Bolus; *Dipcadi*, *Bakerianum*, Bolus; *Urginea alroides*, Bolus; *Herpolirion*

capense, Bolus; *Gethyllis longistyla*, Bolus; spp. nov.)—F. Townsend, 'On an *Erythræa* new to England' (1 tab. *E. capitata*, β. *sphærocephala:* see Journ. Bot., 1881, p. 87).—F. Darwin, 'Theory of the Growth of Cuttings.'—W. Phillips, 'Revision of genus *Vibrissea*' (abstract).

Magyar Novenytani Lapok.—C. Demeter, 'On the Sphæraphides of Rosanoff in the tissue of *Urticaceæ*.'—F. Schaarschmidt, '*Chlorochytrium* in Transsilvania.'—A. Kawitz, 'Plantæ Romaniæ hucusque cognitæ' (contd.)

Midland Naturalist.—J. E. Bagnall, 'Flora of Warwickshire' (contd.)

Œsterr. Bot. Zeitschrift.—M. Willkomm, 'Spanish-Portuguese Plants' (*Sarothamnus commutatus*, sp. n.)—H. Braun, '*Salix Heimerli*,' n. hybr.—D. Hirc, 'On *Crocus vernus*.'—M. Gandoger, 'Pugillus' (conclusion—forms of *Gaudinia fragilis*).—S. S. von Müggenburg, 'Mycological Notes.'—P. G. Strobl, 'Flora of Etna' (contd.)

Popular Science Review.—W. S. Kent, 'The Myxomycetes or Mycetozoa; Animals or Plants?' (2 tab.)

Scottish Naturalist.—J. Knox, 'Life of George Don.'—J. Cameron, 'Gaelic Names of Plants' (contd.)

Proceedings of Societies.

Linnean Society of London.

April 21, 1881.—W. S. Dallas, Esq., F.L.S., in the chair.—Dr. Chas. Barnard, Jas. Bisset, Wm. Holmes, Dr. W. Marriott, John C. Sawer, and S. Stubbs were severally balloted for, and elected Fellows of the Society.—The proposed Alterations of the Bye-laws, read respectively 17th March and 7th April, were again read, balloted for, and negatived; thereafter the chairman read the Alternative Alterations, which motions were balloted for and confirmed.—Several communications on zoological subjects were made, the only botanical paper read being 'Note on *Hibiscus palustris*, Linn., and certain allied species,' by B. Daydon Jackson. In this evidence was adduced to show that Linnæus's description was drawn up from the plant now called *H. roseus*, Thore; that name, therefore, must fall into the category of a synonym. Torrey and Gray have gone further, and, by combining *H. Moscheutos* and *H. palustris*, have entirely sunk the name *palustris*.

May 5.—Arthur Grote, Esq., Vice-President in the chair.—Prof. Eichler, Director of the Botanic Garden, Berlin, was elected a Foreign Member.—There was exhibited for Dr. Maxwell Masters a cone of *Pinus Grenvillea* from Mexico; a "gnaur" from the trunk of the Cedar of Lebanon; and a series of wall diagrams

of Trees, chromo-lithographed by Gerald and Sohn of Vienna.—Mr. Thos. Christ drew attention to a new Indiarubber plant (*Tabernæmontana crassa*) from West Africa.—The following paper, by Dr. George Watt, was read by the Secretary, 'Synopsis of the Indian Species of *Androsace*, with descriptions of some new species.' In this contribution the author passes in review twenty-one species and five varieties, and he describes as novelties *Androsace corrugata*, *A. Stracheyi*, *A. geranifolia*, *A. mucronifolia*, and *A. coronata*.

Botanical News.

The death was announced last month of Dr. R. W. Falconer, of Bath, the author of a 'Catalogue of Tenby Plants,' published in 1848.

Mr. Ronald Campbell Gunn, F.R.S., died in March last, at Launceston, Tasmania, at the age of seventy-three. To Mr. Gunn's exertions we are largely indebted for our knowledge of the Tasmanian Flora; a notice of his travels, coupled with a high eulogium of his collections and botanical attainments, will be found in Sir J. D. Hooker's 'Flora of Tasmania,' p. cxxv.

Dr. Anton E. Sauter died on the 6th of April at Salzburg. He was born at Grossarl, in Salzburg, in 1800, and early manifested an interest in various branches of Natural History, more especially of Botany. Besides his work upon the Flora of Salzburg, he was the author of various botanical papers, contributed for the most part to the 'Flora,' the first appearing in 1824. He had a large herbarium, estimated to contain 20,000 species.

The extensive moss-herbarium of the late Dr. Ernst Hampe, who died at Helmstedt in November last, has been acquired by the Botanical Department of the British Museum.

The herbarium of M. Génévier, containing the types of the numerous *Rubi* described by him, has been added to the Herbarium of the University of Cambridge.

At the Anniversary Meeting of the Linnean Society, on the 24th ult., Sir John Lubbock, F.R.S., was elected President of the Society, and Mr. George J. Romanes, F.R.S., Zoological Secretary, Mr. B. Daydon Jackson retaining the post of Botanical Secretary, which he has filled with signal satisfaction during the past year. The other additions to the Council are Mr. Alfred W. Bennett, Mr. Francis Darwin, and Prof. E. Ray Lankester.

Tab. 221.

1

2

3

4

5

C.B. Clarke del. J.N. Fitch lith.

West, Newman & Co. imp.

Structure of Commelinaceæ.

Original Articles.

NOTES ON *COMMELINACEÆ*.

By C. B. Clarke, M.A., F.L.S.

(Tab. 221.)

I have lately put through the press a Monograph of the Order *Commelinaceæ*, to appear in the forthcoming volume of Messrs. DeCandolle's 'Monographies:' the present paper contains a short view of the order, and details some of the considerations which influenced me in arranging its divisions.

1. *Commelinaceæ* are a small order of plants closely allied to the Lilies, but differing in their unsymmetric flowers and in their seeds. The sepals are three, more or less combined; the petals three, alternate with sepals, free or combined into a tube, distinctly petaloid; the stamens six, in two whorls, whereof several are often difform, barren, or suppressed; the ovary 3-celled, the posterior cell being often smaller, much reduced or suppressed; the style usually long, the stigma small capitate, rarely shortly penicillate; the ovules attached along the inner angle of each cell on two vertical placental lines, but often few or solitary.

The flowers are always unsymmetric; one sepal being entirely without the other two in the bud, and one petal similarly without the other two in the bud: when the ovary appears symmetric, or very nearly so, the style is declinate.

In the seeds the embryo is remote from the hilum, and is not enclosed by the albumen, its base being applied to the embryostega, the small circular depresso-conicoid plate which is conspicuous externally on every seed in this order; see fig. 1 *a*, which represents a section of a seed of *Palisota ambigua* through the embryo (*h* the hilum).

To these two definite ordinal characters, *viz.*, the one entirely outer sepal, the embryostega on the seed, there are no real exceptions. In the minute Callisias the flowers are sometimes reduced 2-merous; then the innermost sepal is suppressed, and the outer sepal is entirely without the second one.

The Australian genus *Cartonema* differs from the rest of the order in its dry wiry habit; but it exhibits one sepal wholly outside the other two and the embryostega on its seeds. *Flagellaria*, on the other hand, has symmetric flowers, and no embryostega on its seeds; and, though by some formerly supposed Commelinaceous, is wholly Liliaceous. There is no genus now known concerning which there is any doubt whether it should be referred to *Commelinaceæ* or no.

2. Linnæus knew three genera of *Commelinaceæ*, viz., *Commelina* and *Callisia* with 3–2 fertile stamens, *Tradescantia* with 6–5 fertile stamens. As new genera were founded in the order, those having 3–2 fertile stamens were placed with *Commelina*, those with 6–5 fertile stamens with *Tradescantia;* the two tribes *Commelineæ* and *Tradescantieæ* have thus arisen. These, however, cannot be definitely demarcated; in a large number of Tradescantias, of the six fertile stamens three are much smaller, more or less difform; the three smaller stamens are in *Tradescantia triandra* sometimes rudimentary, sometimes abortive, in which last case the genus of the plant would appear (from its characters) *Callisia*. *Callisia*, though having but 3–2 stamens, is evidently closely allied to *Tradescantia* itself, and must stand next it; indeed, it may hereafter be considered preferable to treat *Callisia* as merely a section of *Tradescantia*. On the other hand, in *Aneilema Thomsoni* the three smaller barren stamens are sometimes polleniferous. *Pollia* (with six polleniferous stamens) is so like *Aclisia* (with three polleniferous, three barren), that some of the species of the one cannot be distinguished from the corresponding species of the other but by examining the stamens; and the two genera have been, therefore, united by Bentham.

The genera proposed by Hasskarl (who has largely studied the *Commelinaceæ*, are founded in the main on fruit-characters, and are eminently natural; but they include only small clusters of species, and are equipollent with what Bentham would call sections, or perhaps subsections; nor, so far as I am aware, has Hasskarl put out any plan for dividing the whole order into a limited number of tribes, or for collecting his small genera into groups. Moreover, I have found that if I arrange the genera of *Commelinaceæ* upon fruit-characters I should by no means avoid exceptions and anomalies. Of this, one striking example occurs in *Tinantia*. All the true Tradescantias have two ovules (and normally two seeds) in each cell; Scheidweiler founded *Tinantia* (*T. fugax*) on the old *Tradescantia erecta*, which has a peculiar inflorescence, and three (or more) ovules in each cell. The genus, so far, appears good and well limited; but there is a species (*Tinantia Sprucei*, C. B. Clarke) which has the inflorescence and habit exactly of *Tinantia fugax*, but the ovules are in none of the examples more than two in one cell. This species must, as Bentham has noted, be placed with *Tinantia fugax*, whether that be retained as a genus or appended (as in Kunth) as an anomalous section to *Tradescantia*. But, whatever be done with these plants, they will spoil any neat delimitation of the tribes proceeding on fruit-characters.

A further objection to rearranging the genera of this order in tribes founded on fruit-characters is that it would involve either accepting the too numerous small genera of Hasskarl, or founding new larger genera, or taking up a certain number of Hasskarl's generic names and widening very much their characters. Any one of these plans would lead to confusion, and would, moreover, afflict nearly half the well-known species of the order with novel names. And when this had all been endured, I found that the

linear sequence of the genera would not be nore natural, nor the exceptions fewer than on the old plan. I have therefore adopted the two old tribes *Commelineæ* and *Tradescantieæ*, but I have taken out first (to form a small separate tribe, *Polliieæ*), three closely allied genera, differing from all the rest of the order in their indehiscent fruit.

3. The tribes and genera then stand as under:—

TRIBUS I. POLLIEÆ.—Fruit indehiscent; crustaceous or baccate.

1. POLLIA.—Panicle without folded bracts. Stamens six, all fertile, or three (terminated by gland-like anthers) barren. Leaf-margins glabrous or crispedly pubescent. Species 14, Old World.

2. PALISOTA.—Panicle without folded bracts. Stamens three fertile, 3–2 sterile terminated by bundles of hairs. Leaf-margins silky. Species 8, Africa.

3. PHŒOSPHERION.—Inflorescence of 1–2 small racemes almost enclosed within a folded bract (as in *Commelina*). Barren stamens 2–3, with hastate triangular anthers. Species 4, America.

TRIBUS II. COMMELINEÆ.—Capsule 2–3-valved. Fertile stamens 3–2.

* Stamen next the outer sepal sterile; cells of the fertile anthers nearly straight.

4. COMMELINA.—Inflorescence of 1–2 small racemes, almost enclosed within a folded or hooded bract. Barren stamens 2–3, with cruciform anthers. Species 88, in both hemispheres.

5. POLYSPATHA.—Inflorescence of small racemes almost enclosed within folded bracts, which bracts are sessile along the branches of a panicle. Species 1, Africa.

6. ANEILEMA.—Flowers panicled or clustered, without folded bracts. Species 57, in both hemispheres.

** Stamen next the outer sepal fertile; cells of the fertile anthers twisted like corkscrews.

7. COCHLIOSTEMA. — Flowers large, panicled. Species 1, Ecuador.

TRIBUS III. TRADESCANTIEÆ.—Capsule 2–3-valved. Fertile stamens 6-5.

A. Old World genera.

8. BUFORRESTIA.—Capsule 3-celled, with 4–10 seeds in each cell. Species 4, Africa and Guiana.

9. FORRESTIA.—Ovary 3-celled, with two ovules in each cell. Inflorescence subcapitate, boring through the sheath of the leaf. Petals separate. Species 6, Asia.

10. COLEOTRYPE.—Capsule 3-celled, with 2–1 seeds in each cell. Inflorescence dense, splitting the leaf-sheath. Corolla-tube linear. Species 3, Africa.

11. Cyanotis.—Capsule 3-celled. Seeds two in each cell, vertically superimposed, truncated along their plane of contact, each carrying its embryostega to the end remote from this flattened plane. Species 29.

12. Streptolirion.—Capsule 3-celled, with two seeds in each cell. An extensive twiner, with long-petioled cordate-ovate leaves. Species 1, India.

13. Cartonema.—Capsule 3-celled, with two seeds in each cell. Tufted, with rigid-linear leaves. Flowers spicate. Filaments short. Species 5, Australia.

14. Floscopa.—Capsule 2-celled, with one seed in each cell. Racemes paniculate. Species 11, in both hemispheres.

B. American genera (see also *Floscopa* and *Buforrestia*).

* Petals separate or nearly so.

† *Cells of the ovary* 3–5-*ovulate* (in the anomalous species of *Tinantia* 2-ovulate).

15. Pyrrheima.—Densely rusty hirsute. Capsule papery. Species 1.

16. Dichorisandra.—Anther dehiscing by two apical pores. Fruit 3-valved; seeds immersed in pulp. Species 27.

17. Tinantia.—Peduncle solitary terminal, dividing into two or three racemes, scarcely umbellate. Capsule membranous, greenish. Species 3.

†† *Cells of the ovary* 2-*ovulate.*

18. Tradescantia.—Umbels simple or compound. Species 32.

19. Callisia.—Stamens 3–1 fertile, none sterile or rudimentary. Species 4.

20. Spironema.—Flower-heads dense, scattered sessile in a lax panicle. Species 1.

21. Campelia.—Sepals in fruit succulent, enclosing the thin papery capsule. Species 1.

22. Sauvallea.—Small. Flowers solitary, subincluded within folded *Commelina*-like bracts. Species 1.

††† *Cells of the ovary* 1-*ovulate.*

23. Rhæo.—Flowers in dense umbels, enclosed within boat-like bracts. Species 1.

24. Leptorhæo.—Flowers loosely panicled. Bracts small. Species 1.

** Petals united into a linear tube.

25. Zebrina.—Flowers subsessile between the two uppermost leaves of the branches. Species 2.

26. Weldenia.—Flowers sessile axillary, splitting the leaf-sheath. Species 1.

In all 307 species; whereof only three, viz., *Commelina nudiflora*, *C. capitata*, and *Aneilema orato-oblongum* are found in both hemispheres. The species are mainly tropical; *Commelina communis*

extends north to Amurland, and *Tradescantia virginica* to Lake Wisconsin. Several species reach southwards to Monte Video and the Cape of Good Hope; in Australia they are hardly found so far from the tropic.

The arrangement of stamens in the genus *Commelina* is represented diagrammatically in fig. 3; the whorls are regularly placed, the three of the outer whorl opposite the sepals, the three of the inner whorl opposite the petals; two stamens of the outer, one of the inner whorl being fertile; the fertile stamen of the inner whorl (next the outer petal) being slightly larger than, and unlike the others; the barren stamen of the outer whorl (next the outer sepal) has a strong tendency to disappear, being usually wanting in many of the species.

The stamens throughout the order follow this arrangement; the first stamen to become sterile and to disappear being that opposite the outer sepal. In *Aneilema* the three fertile stamens are figured by Wight alternate with the sterile, and I have copied some of his figures in my 'Commelinaceæ Bengalenses;' but Bentham has remarked that this is an error. The stamens in *Aneilema* are really as in *Commelina*, but by a displacement of the whorls the two fertile ones (which are really next the two inner sepals) are declinated so as to appear opposite the two inner petals.

But *Cochliostema* is a remarkable exception, as shown in fig. 2; it has those stamens fertile which in *Commelina* are sterile, and those sterile which are in *Commelina* fertile. *Cochliostema*, so far as its stamens are concerned, stands in the same relation to other *Commelinaceæ* that *Cypripedium* does to other Orchids; but *Cochliostema* has other strongly distinctive characters. In the *Commelinaceæ*, with numerous ovules in each cell of the ovary, these are arranged vertically on two placental nearly coincident lines at the inner angle of the cell; in many cases the ovules are evidently biseriate, but in general the resulting seeds are squeezed into one vertical row, being exactly superimposed like a basaltic column, as in fig. 4 *c*, which represents the seeds of one cell of an *Aneilema* (*A. Thomsoni*) seen from without. In the single instance of *Cochliostema* the seeds are in two vertical columns in each cell, fig. 4 *b*. In several subgenera the seeds are imperfectly biseriate, as shown in fig. 4 *a*, which represents the seeds of one cell of an *Aneilema* of Sect. *Dichaspermum* seen from without. *Dichaspermum*, founded on this character, has been generally accepted as a genus distinct from *Aneilema*; but I have, after some hesitation, reduced it to a section, because I find that some species in *Pollia* and *Palisota* are Dichæspermous; so that to admit this single character as of generic value would necessitate the dichotomising of these small very homogeneous genera also. It should be recollected that in *Dichæspermum* itself the species are of two different types of inflorescence, both fully represented among the Aneilemas with 1-ranked seeds. The character "Dichæspermous" requires care in working even with perfect ripe capsules. For if the seeds are 1-ranked, and one of the three capsule-valves be removed from a capsule pasted down on a herbarium sheet, it dehisces from the axis, and leaves two

ranks of seeds with no septum between them. I find (not rarely) in herbaria Aneilemas with 1-ranked seeds named *Dichæspermum* by experienced botanists, I presume misled in this way.

The seeds in all these cases have the embryostegas on their backs, with the embryo either transverse or opposite to the hilum; the embryostega is, as regards the axis of the capsule, *lateral*, as it is in all genera of *Commelinaceæ*, except one, viz., *Cyanotis*. The seeds in this are two in each cell, vertically superimposed, the hila lateral as usually; but the upper seed has its embryostega towards the apex of the ovary, the lower seed has its embryostega towards the base of the ovary, as represented in fig. 5, which represents a vertical section through the seeds of one cell of a capsule of *Cyanotis*. R. Brown fixed on this as the distinguishing mark of the genus; but it seems to have been completely lost sight of since his day; so that, while new genera have been proposed for very ordinary species of *Cyanotis*, even Dr. Hasskarl remains in doubt whether some of the Malayan *Cyanotis* may not be *Tradescantia*. But the old mark, given by R. Brown, keeps all the Old World species in *Cyanotis*, all the New World in *Tradescantia*, and is a simple definite mark which divides out a large mass of species according to their true natural affinity.

Several of the American genera of *Tradescantieæ* are very closely allied; but *Spironema* and *Tinantia*, which differ little from *Tradescantia* in character, differ considerably in habit. It would, perhaps, have been better if *Callisia* had never been separated generically from *Tradescantia*, but it is an old genus accepted by Linnæus and every one since.

The fruit of several species not hitherto known, and of the genera *Cochliostema* and *Pyrrheima*, was obtained for me by Mr. N. E. Brown, who succeeded in artificially fertilising the plants in the Kew Conservatories which in previous years set no fruit.

4. As to the subdivision of the larger genera.

In *Commelina* the dorsal cell of the ovary has one ovule only, or is suppressed, the two ventral cells contain either two ovules each or one each; this character is, as far as I know, *absolute* for each species, *i. e.*, among the species which have one ovule only in each ventral cell, I have never met with a single case where two ovules occurred. The large genus *Commelina* thus readily subdivides into *Didymoon* (sixty-three species) and *Monoon* (twenty-five species). I do not believe that any of the species of *Didymoon* is merely a form of some *Monoon*. I mention this point the more particularly, because Bentham, in the 'Flora Australiensis,' has united some of R. Brown's species. In so large a genus as *Commelina*, many botanists would consider it convenient to establish *Monoon* as a new genus; but, though it may be distinguished from *Commelina* by a single absolute character, the habit is identical, and the three sections of *Commelina* (*Didymoon*) are represented by three sections of *Monoon*. These sections are grounded on the degree of reduction of the dorsal cell of the capsule; in the first section it dehisces loculicidally like the two other cells; in the second section

it is indehiscent, often smaller than the others; in the third section it is altogether suppressed, or occasionally present in a reduced barren form. Some of the species with 2-celled capsules *may* possibly prove only varieties of corresponding species, with 3-celled capsules as Bentham suspects, which is an additional ground for not adopting some genera of Hasskarl that differ only in the number of the cells being two or three.

The large genus *Aneilema* divides into two subgenera, *viz.*, *Tricarpellaria*, having the capsule equally 3-celled, *Dicarpellaria* having the capsule 2-celled, the third dorsal cell being occasional present, but much smaller. Hasskarl's genus *Lamprodithyros* might, by an extension of its character, be made conterminous with *Dicarpellaria*, and would make then a very fair genus of nineteen species. These, however, are not separable in habit from other Aneilemas, and are scattered geographically over Africa, America, Australia: after consulting Mons. Alph. DeCandolle, I have preserved *Aneilema* as defined by its author, R. Brown.

In the large genus *Tradescantia* the capsule seems in all the species alike, having three cells dehiscing loculicidally, with two superimposed seeds in each cell. The seeds in the different species differ only slightly in size and foveolation. I have therefore adopted the two old sections, *Eutradescantia*, with six subequal stamens, and *Descantaria*, having three longer stamens, three shorter more or less dissimilar. But some species have about as good a claim to be put in one of these sections as the other, so that I can by no means consent to those who have wished to make *Descantaria* a genus. It has also been proposed to found genera on the width of the connective between the anthers, a character which may be observed in various genera of this order remote from *Tradescantia* as in *Floscopa*. The character is of value in *Tradescantia* for specific discrimination, but in three anthers out of one flower I have seen the connective in one narrow, in another very wide, in the third intermediate.

5. As regards specific characters there is little to be said peculiar to this order. I cannot distinguish the species by eye myself, nor do I believe that Mr. Bentham himself can (at all safely); Wallich has pasted down nine species (belonging to three genera) under *Commelina communis*, Linn., Wall. Cat., 8978 (no one of the nine is, however, *Commelina communis*, Linn.) On the other hand, different plants of one species in this group often differ enormously in size, shape of leaves, hairiness, shape and disposition of spathes, size of flowers, shape of the petals, number of barren stamens, and sometimes even in number of fertile stamens. A striking instance is afforded by *Commelina obliqua*, Ham., an abundant species in India, which is sometimes glabrous, sometimes very hairy viscid, has sometimes solitary, generally agglomerated spathes; yet Hook. f. and T. Thoms., and, I believe, all the Bengal botanists, are agreed that the whole series makes up but one species.

I am therefore very little satisfied by the genus *Dichorisandra*, in

which some thirty species have been founded on slight differences in the shape and hairiness of the leaves, in the pubescence of the sepals, and in the length of the panicle. I doubt if there are many good species in the genus. I have only been able to examine the fruit in a few cases, but it seems to me not likely that any good specific distinctions will be got out of the fruit. The primary division of this genus has been into (*a*) with six stamens, (*b*) with five stamens, but then it is admitted that the most abundant 6-stamened species (*D. Aubletiana*) has sometimes only five stamens. As to the distinction between terminal and radical inflorescence, the typical species *D. radicalis* sometimes produces a terminal panicle; while several of the terminal-panicled species throw branches boring through the base of one of the lower leaf-sheaths. Several of the species admitted by Kunth and Seubert are founded on few, or even a single herbarium example: not knowing this genus in the field, I have as regards the species been able to do little more than copy my predecessors, reducing a few where the material was plentiful, or where the species appear to have been founded on identically the same thing. In species-making I have endeavoured to hit a mean; I have made somewhat more than Bentham, a good many less than Hasskarl, makes out of the same material. Of the 307 species described, seventy-one are described for the first time; these are mainly from the Tropical African collections of Mann, Schweinfurth, and Welwitsch. Many of the other 236 have new names, or appear in novel dress; I learnt from Mr. Baker that *Dracæna triandra*, Afzel., is a *Palisota*, and from M. DeCandolle that *Polygala axillaris*, Poir., is a *Floscopa*.

6. Besides the new genera described, there are several remarkable new species referred to old genera.

Commelina huillensis, Welw. MS., is a stemless species, with numerous large azure flowers; and Welwitsch collected two other striking species allied to this in Angola also.

Aneilema sepalosum, sent from Ukamba in Africa by Hildebrandt, is a scapose species allied perhaps to *Murdannia* of Royle, but has the sepals $\frac{2}{3}$ in. long.

Aneilema Thomsoni, described originally by Hasskarl as *Dichæspermum giganteum*, supposed a *Smilacina* by Griffith, proves to be a *Euaneilema*, but with a capsule more than $\frac{3}{4}$ in. long.

Aneilema brasiliense, collected by Gardner, in habit resembles *Tinantia*, and is perhaps the type of a new genus.

Floscopa flavida is yellow-flowered; this (with another new allied species) were communicated by Schweinfurth from Central Africa.

Tradescantia minuta grows in tufts, the stems 1–2 in. high; collected by Uhde in Mexico; a single sheet in the Berlin Herbarium.

7. For the preparation of the monograph of this order, I was able to examine in detail the Kew collection, including Wight's private Herbarium, containing the *ipsissima exempla* from which his Icones were constructed. At the Linnean Society I examined

Wallich's collection, and was favoured with permission to dissect the plants in Linnæus's own herbarium. At the British Museum I saw the type-plants of R. Brown and other older collectors, and the fine collection of Welwitsch. At Paris I looked through the general herbarium, and saw also Kunth's private herbarium, some fine old collections from Australia, and some Arabian collections. At Geneva I saw the three great herbaria there; Boissier's is very rich in fine sets of Balansa and other first-class modern collections, while DeCandolle's contains Poiret's and other old collections, and is specially valuable from having been steadily worked and adnoted upon from the early days of Aug. Pyr. DeCandolle to the present time. Through the kindness of M. Cogniaux, the Brussels Herbarium was sent me at Kew; it contained many types of Martens and Galeotti, some of Seubert. The Berlin Herbarium was sent me at Kew through the kindness of Eichler; this was invaluable, as it contains nearly all that Kunth described in his Enum. Pl., with his MS. notes attached to the specimens. Dr. Hasskarl most kindly sent me at Kew the portion of his private herbarium containing his own new species, except those which I had already seen written up by him in the Candollean and Berlin Herbaria.

Lastly, when my work was near completion, Mr. Carruthers placed in my hands the MSS. of R. Brown, which contain very full descriptions of all the Commelinaceous material he had access to at the date. He seems to have taken a special interest in the order, and in his diagnoses of *Commelina* puts *in front* the number of cells and ovules in the ovary. I have followed him as regards the Australian species; from his very close manner of working he may have admitted a few too many, as F. Mueller has warned me in a letter; but, with the limited Australian material before me, I hesitate to reduce R. Brown's species, though I shall not be surprised if the arrival of copious specimens hereafter prove F. Mueller right in his views. In collecting the literature, I have had the great advantage of the fine library and systematic indexing of Kew, and M. DeCandolle placed in my hands the sixty years' collection of notices accumulated in his herbarium. I hope that not much of importance has escaped me; but, in the present state of botanic literature, I dare not hope that there are no omissions.

Explanation of Plate 221.

1. Palisota, Sect. *Monostichos.*—*e*. Indehiscent capsule (× 2 or 3). *d*. Horizontal section of same. Hila axial; embryos exterior. *c*. Seeds of one cell of the same capsule, *in situ*, seen from without; the embryostega of each seed is seen without. *b*. The seeds as in *c*, but seen from within; the hila forming the inner angle. *a*. Horizontal section of one seed (× 10) through the embryo.

3. Commelina.—Diagram of flower; showing the whorls of its parts, *viz.*:—(1). Outer of three sepals, imbricate, one wholly exterior. (2). Of three petals, imbricate, and one wholly exterior, alternating with whorl (1). (3). Of three stamens, alternating with whorl (2). (4). Of three stamens, alternating with whorl (3). (5). Of three carpels, alternating wtth whorl (4).

2. Cochliostema.—Diagram of flower, showing the whorls of its parts, *viz.*:—(1). Outer of three sepals, imbricate, one wholly exterior. (2). Of three petals,

imbricate, one wholly exterior. (3). Of one stamen and two staminodes. (4). Of two stamens. (5). Of three carpels.

4. Arrangement of Seeds.—c. *Aneilema* Sect. *Euaneilema*.—Seeds of one cell, *in situ*, seen from without. b. *Cochliostema*.—Seeds of one cell, *in situ*, seen from without. a. *Aneilema*, Sect. *Dichæspermum*.—Seeds of one cell, *in situ*, seen from without.

5. Cyanotis.—Seeds of one cell *in situ;* a vertical section of them in a plane passing through the axis of the capsule.

ON A COLLECTION OF FERNS MADE BY MR. W. KALBREYER IN NEW GRANADA.

By J. G. Baker, F.R.S.

Mr. Kalbreyer, already favourably known for his botanical explorations in the Cameroon country and South America, whilst exploring for Messrs. Veitch in New Granada in the summer of 1880, made a large collection of Ferns, which have been placed in my hands for determination.

There is a complete list by Mettenius of the Ferns of New Granada in the Cryptogamic volume of the 'Prodromus Floræ Novo-Granatensis' of Triana and Planchon, so that I will confine myself to noticing the novelties and species of special interest which Mr. Kalbreyer has gathered. Except where otherwise stated they are all from the backwoods of the province of Antioquia. The figures prefixed are Mr. Kalbreyer's collecting numbers, and those within brackets show where the new species fall in the sequence followed in our 'Synopsis Filicum.'

1702. *Cyathea insignis*, Eaton.

1867, 1870. *Hemitelia nigricans*, Presl.

Alsophila gibbosa, Klotzsch.

1518. *Alsophila pubescens*, Baker.

1375 (12*). Alsophila podophylla, Baker, n. sp. — Caudex slender, 10–15 feet long. Fronds dark glossy green, moderately firm in texture, quite glabrous, 6 feet long, bipinnatifid. Pinnæ lanceolate-deltoid, 2 feet long, their rachises glossy, naked, castaneous. Pinnules with stalks $\frac{1}{4}$–$\frac{1}{2}$ in. long, lanceolate, 5–6 in. long, 18–21 lin. broad, cut down to a broad wing to the midrib into oblong contiguous obtuse tertiary segments $\frac{1}{4}$–$\frac{1}{3}$ in. broad. Veins 10–12-jugate in the tertiary segments, deeply forked, distinct, erecto-patent. Sori small, placed generally one to each vein at its forking nearer the midrib than the edge.—Forests at 4500 feet. This has the firm texture and long-stalked pinnules of *Cyathea divergens*. Amongst the Alsophilas it comes nearest to *A. gibbosa*.

1561 (37*). Alsophila hispida, Baker, n. sp. — Caudex short. Fronds spreading, drooping, 8–10 feet long, quadri-pinnatifid, the unarmed stramineous main rachis finely pilose, the green lamina hairy on both sides, densely hispid on the midrib of the pinnules beneath. Pinnæ oblong-lanceolate, 1½–2 feet long, 6–8 in. broad. Pinnules lanceolate, nearly sessile, 10–13 lines broad, cut down to

the hispid rachis, into oblong adnate deeply regularly pinnatifid tertiary segments, with lanceolate-deltoid entire contiguous ultimate lobes. Veins indistinct, forked in the lower 4-nary segments. Sori 1–2, placed near the base of each 4-nary segment.—Forests at 7500 feet. Allied to *A. oligocarpa*, Fée (*A. decomposita*, Karsten).

1327. ALSOPHILA ? LATE-VAGANS, Baker, n. sp.—Caudex ? Stipe ? "Frond procumbent, bluish green, glossy, 10–12 feet long," bipinnatifid. Main rachis naked, very glossy, slender, castaneous. Pinnæ spreading, lanceolate, on castaneous petioles 1½–2 in. long; lamina lanceolate, about half a foot long, 18–21 lines broad, cut down to a narrow wing to the main rachis into lanceolate entire spreading contiguous pinnules ¼ in. broad; texture subcoriaceous; upper surface green; lower decidedly glaucous; both quite free from hairs and scales. Veins fine, close, distinct, erecto-patent, all except the uppermost forked. Sori small, globose, subcostular, 8–10-jugate in the lower pinnules.—Open forests, alt. 6700 feet. I do not know what to make of this, The sori are those of an *Alsophila*, but the habit seems most peculiar, and in other respects it shows no near affinity to any species we possess already. The pinnæ in size and cutting look like fronds of *Polypodium vulgare*.

1751. *Hymenophyllum splendidum*, Bosch.

1406. *Trichomanes botryoides*, Kaulf.

1857 (39*). TRICHOMANES KALBREYERI, Baker, n. sp. — Stipes naked, 1–2 in. long, broadly winged down to the very base. Frond lanceolate, 4–6 in. long, 18–21 lines broad at the middle, narrowed to both ends, bipinnatifid, finely pilose on both surfaces, with a regular distinct entire wing a line broad all the way down the main rachis. Pinnæ lanceolate, deeply pinnatifid, ¼–⅓ in. broad, the segments adnate and erecto-patent, the upper lanceolate and one-veined, the lower forked or bifid, with a vein down the centre of each lobe. Sori solitary, immersed in the tips of the secondary segments; involucre twice as long as broad, without any lip or collar; receptacle much exserted.—On trees in damp forests at 6500 feet. Comes in midway between *T. Kaulfussii* and *macilentum*.

1407. *Trichomanes fœniculaceum*, Hedw.—This is new to the American continent.

1859 (18*). DICKSONIA PUBESCENS, Baker, n. sp. — Rootstock wide-creeping. Frond drooping, 5–6 feet long. Stipe 2 feet long, brown-stramineous, scaly towards the base. Frond ample, deltoid, tripinnatifid, moderately firm in texture, dark green on both sides, thinly clothed with minute brown scales on both surfaces, especially on the costæ of the pinnæ and pinnules. Pinnæ oblong-lanceolate, patent, the central ones a foot long, 3–4 in. broad; the lower ones dwarfed. Pinnules sessile, lanceolate, crowded, patent, ½–⅝ in. broad, cut down to a narrow wing into oblong-quadrate dentate tertiary segments. Veins pinnate in the tertiary segments; veinlets 2–3-jugate, remote, simple, erecto-patent. Sori 4–6 to a fully-developed tertiary segment, marginal, terminal on the veins. Involucre cup-shaped, the outer part of the involute edge of the frond rather modified in texture.—Woods at 6500 feet. Allied

to *D. scandens*, Baker, discovered not long ago by Father Sodiro in Ecuador.

1669. *Davallia fumarioides*, Swartz.

1435, 1708. *Blechnum brasiliense*, Desv.

1651. *Lonchitis Lindeniana*, Hook., which I cannot separate specifically from the Old World *L. pubescens*, Willd.

1298. *Pteris acclivis*, Mett.

1353. *P. obscura*, Mett.

1817 (25*). Asplenium (Euasplenium) filicaule, Baker, n. sp.—Rhizome thread-like, creeping to a length of a foot or more. Stipe very short, naked. Frond oblong-lanceolate, simply pinnate, membranous, light green, glabrous, about an inch long by half as broad. Pinnæ 4–7-jugate, petioled, entire, about $\frac{1}{4}$ in. long, the barren ones oblong, the fertile ones oblong-rhomboid. Vein only a midrib to each pinnæ, which falls considerably short of its tip. Sorus one to a pinna, running along the midrib, beginning just above its base and ending at its tip. Involucre indistinct, membranous, glabrous, persistent.—On trunks in the forest, Murri, alt. 2700 feet. Allied only to *A. holophlebium*, Baker, another of Father Sodiro's discoveries in the Andes of Ecuador.

1843. *Asplenium* (*Diplazium*) *Sprucei*, Baker.

1876 (210*). Asplenium (Diplazium) longisorum, Baker, n. sp.—Stipes tufted, $1\frac{1}{2}$–2 feet long, naked, dull brown. Fronds oblong, simply pinnate, $1\frac{1}{2}$–2 feet long, moderately firm in texture, green and glabrous on both surfaces. Pinnæ 4–5, the end one like the others, the side ones erecto-patent, sessile, oblong-lanceolate, narrowed to both ends, entire, 12–18 in. long, 3–4 in. broad at the middle. Veins close, distinct, erecto-patent, three in a group springing together from the costa, the central one often forked higher up. Sori narrow, running from the base of a vein nearly to its tip, often 2 in. long. Involucre very narrow and inconspicuous.—Moist shade, at 4000 feet. Allied to *A. nicotianæfolium*, Mett., and the Old World *A. bantamense.*

1641, 1852. *Asplenium sandwichianum*, Mett.

1777. *A. ferulaceum*, Moore.

1454 (4*). Nephrodium (Lastrea) longicaule, Baker, n. sp.—Caudex epigæous, decumbent, nearly a foot long, $\frac{1}{4}$ in. thick, densely clothed with ascending dark brown linear acuminate paleæ. Stipes $\frac{1}{2}$ foot long, remote, wiry, glossy, stramineous, nearly naked. Frond lanceolate, about a foot long, $1\frac{1}{2}$–2 in. broad, simply pinnate, glabrous, green on both sides, moderately firm in texture, much narrowed at the base. Pinnæ 30–40-jugate, sessile, patent, $\frac{1}{4}$–$\frac{1}{3}$ in. broad, unequal-sided, reduced on the lower side of the costa, auricled on the upper side at the base, with few short round-quadrate contiguous lobes, shown principally in the lower half of the upper edge; lower pinnæ remote and very dwarf. Veins pinnate against the lobes of the pinnæ; veinlets simple, obscure, 2–3-jugate. Sori small, medial, consisting of but few sporangia. Involucre glabrous, evanescent.—Moist shady slopes, alt. 7500 feet, Near *N. pusillum*, Baker.

1347, 1871 (35*). Nephrodium (Lastrea) valdepilosum, Baker,

n. sp.—Stipes tufted, 6–9 in. long, densely clothed, as is the rachis, with fine soft squarrose pale brown hair-like paleæ. Fronds dimorphous. Sterile lamina oblong-lanceolate, 1–1½ ft. long, about half a foot broad, bipinnatifid, moderately firm in texture, green on both sides, clothed, especially on the upper surface, with long hair-like paleæ like those of the stipes and rachis. Pinnæ crowded, sessile, lanceolate, the lower ones much deflexed, but little dwarfed, 3–4 in. long, ¾–1 in. broad, cut down to a narrow wing into contiguous entire linear-oblong secondary segments ⅙ in. broad. Veins pinnate in the secondary segments; veinlets erecto-patent, simple, 10–12-jugate. Fertile fronds more lanceolate, with longer stipes and smaller pinnæ. Sori small, costular. Involucre reniform, brown, hispid, persistent.—Forest shade, alt. 4000–5000 feet. Allied to *N. velleum* and *trichophorum*.

1806 (205*). Nephrodium (Sagenia) antioquoianum, Baker, n. sp. —Stipe dull brown, glossy, glabrous, above a foot long. Frond oblong-deltoid, thin but firm in texture, green and naked on both sides, 12–18 in. long, simply pinnate. Pinnæ 5–7, oblong-lanceolate, 6–9 in. long, 2–2½ in. broad, entire, acuminate, the upper side ones adnate to the rachis and decurrent, the lowest almost petioled, forked on the lower side at the base. Main veins fine, arcuate ascending, distinct from the midrib to the edge of the pinnæ, ¼–⅓ in. apart; intermediate areolæ very copious, irregular, with abundant free included veinlets. Sori copious, middle-sized, forming two regular rows near the main veins and many others between these. Involucre firm, distinct, glabrous.—Forest shade, alt. 3000–4000 feet. Allied to *N. subtriphyllum* and *latifolium* of the Old World.

1807 (11*). Polypodium (Phegopteris) sylvicolum, Baker, n. sp. —Stipe 1½ ft. long, dull brown, distantly scaly up to the summit. Frond oblong-lanceolate, 1½–2 feet long, 8–10 in. broad, bipinnatifid, membranous, glabrous, bright green on both surfaces. Pinnæ lanceolate, those of the upper half of the frond adnate to the rachis and decurrent, the lowest, which are the largest, shortly petioled, 4–6 in. long, 1–1½ in. broad, cut down to a broad wing into contiguous subentire lanceolate-deltoid secondary segments. Veins pinnate in the secondary segments; veinlets 5–6-jugate and simple, except in the lowest pinnæ, where they are more numerous and branched. Sori moderately large, orbicular, medial on the veins.—Forest shade, 3200 feet. Habit and texture of *P. flavo-punctatum*, but the pinnæ cut down throughout to a narrow wing to the rachis.

1944. *Polypodium inæquale*, Fée.

1472. *P. andinum*, Hook.

1394. *P. leucosticton*, Fée.—A variety of *P. taxifolium*, L.

1578. *P. meridense*, Klotzsch.

1703 (134*). Polypodium (Eupolypodium) antioquoianum, Baker, n. sp.—Stipes very short, densely tufted; basal paleæ minute, subulate. Fronds linear, 1–3 in. long, ⅛ in. broad, simply pinnate, moderately firm in texture, with an elastic black thread-like rachis, both surfaces furnished with a few long hairs. Pinnæ 20–30-

jugate, oblique-oblong, adnate to the rachis, about a line broad, the lower ones gradually dwarfed, each with a single medial vein, with a short fork at its base. Sori solitary on the pinnæ, placed at the end of the midrib near their tip, orbicular, superficial.—On trees amongst moss in forests at 5000 feet. Allied to *P. trichomanoides* and *exiguum*.

1947. *Polypodium graveolens*, Baker.

1505. *P. villosum*, Karsten.

1325. *Jamesonia verticalis*, Kunze.

1819. *Gymnogramme pumila*, Spreng.

1487 (33*). GYMNOGRAMME VELLEA, Baker, n. sp.—Stipes densely tufted, wiry, 1–2 in. long, densely clothed with fine short spreading crisped subulate paleæ, as is the main rachis. Fronds lanceolate, bipinnate, 2–3 in. long, $\frac{3}{4}$–$\frac{1}{2}$ in. broad, firm in texture, bright green and pilose on both surfaces. Pinnæ numerous, erecto-patent, lanceolate, $\frac{1}{8}$–$\frac{1}{6}$ in. broad, cut down to the rachis into cuneate close erecto-patent pinnules, the lowest with 3–5 short 1-veined lobes at the apex. Veins 1 to the upper pinnules, one running into each lobe of the lower ones. Sori oblong, occupying the lower part of the pinnules.—Forest border, alt. 8800 feet. Like dwarf *G. Warcewiczii*, densely pilose, with 1-veined ultimate segments.

1563 (50*). GYMNOGRAMME XEROPHILA, Baker, n. sp.—Densely tufted. Fronds 4–5 feet long, quadripinnate, thick and firm in texture, dark green and glabrous on the upper surface, matted all over with persistent pale brown tomentum beneath; rachis bright brown, similarly tomentose. Pinnæ lanceolate-deltoid, a foot or more long, distinctly petioled. Pinnules lanceolate, 3–4 in. long, 1–1$\frac{1}{2}$ in. broad. Tertiary segments sessile, oblong-lanceolate, $\frac{1}{2}$–1 in. long, deeply pinnatifid, with close semi-orbicular final lobes $\frac{1}{2}$–$\frac{1}{8}$ in. broad, their margins slightly revolute. Final veining flabellate-pinnate. Sori slender, running along the veins.—Open rocky places, alt. 8000 feet. Texture and vestiture of *G. ferruginea* and *aureo-nitens*, but much larger and more compound.

1365. *Gymnogramme prehensibilis*, Baker.—Gathered before only by Pearce.

1453, 1865. *Meniscium giganteum*, Mett.

1440. *Acrostichum castaneum*, Baker.

1371, *A. Gardnerianum*, Fée.

1873 (82*). ACROSTICHUM (POLYBOTRYA) BOTRYOIDES, Baker, n. sp.—Rhizome wide-scandent, with distant horizontal spreading stiff dark glossy green glabrous fronds. Stipe 1$\frac{1}{2}$ ft. long, dull brown, with large lanceolate brown paleæ towards the base. Barren fronds ample, quadripinnate. Central pinnæ oblong-deltoid, 1$\frac{1}{2}$ ft. long, 6–8 in. broad. Pinnules lanceolate, 3–4 in. long, 1–1$\frac{1}{4}$ in. broad; tertiary segments sessile, oblong-lanceolate, $\frac{1}{6}$ in. broad, cut down to the rachis in the lower part, into close parallel adnate oblong-rhomboid quarternary segments. Veins forked or sub-pinnate in the final segments. Fertile frond tripinnate, the small oblong distinctly stipitate soriferous final segments regularly pinnately arranged.—On trees in the forests, 6000–7000 feet. Fertile frond and its final segments in shape, size, and arrangement

just as in *A. canaliculatum*, Hook., but the barren frond much more ample and compound.

1877 (105*). Acrostichum (Gymnopteris) suberectum, Baker, n. sp.—Rhizome wide-creeping. Barren fronds 4½–5 feet long, close, suberect. Stipes naked, brown-stramineous, as is the main rachis. Barren frond simply pinnate, green on both sides, glabrous, chartaceous in texture. Pinnæ oblong-lanceolate, the upper adnate to the rachis, the lower free and shortly petioled, about a foot long, 2–3 in. broad, acuminate, broadly rounded on both sides at the base, shallowly lobed only towards the base. Main veins distinct to the edge, fine, rather ascending, ⅓–½ in. apart in the fully-developed pinnæ; veinlets 5–6-jugate, simple, very ascending, the lowest of each group joining about a third of the distance from the midrib to the edge. Fertile frond fully bipinnate, its pinnæ lanceolate, 6–9 in. long, cut down to the rachis into ligulate obtuse entire or slightly crenate parallel pinnules ⅛–⅙ in. broad.—On old trees in the forests, 4000–4500 feet.

1254 (105*). Acrostichum (Gymnopteris) polybotryoides, Baker, n. sp.—Rhizome wide-scandent, densely clothed with crisped linear-subulate bright brown paleæ. Stipe of barren frond stramineous, naked, 3–5 in. long. Barren frond oblong-lanceolate, simply pinnate, 1½–2 feet long, subcoriaceous, bright green and entirely naked on both surfaces. Pinnæ patent, lanceolate, many of the lower ones shortly petioled, 3–5 in. long, ¾–1 in. broad, acuminate, entire, equally deltoid or rounded on both sides at the base. Main veins fine, erecto-patent, distinct to the margin, ¼ in. apart; veinlets 3–4-jugate, simple, very ascending, the groups joining regularly about half-way between the midrib and margin. Fertile frond bipinnate, with numerous lanceolate acuminate pinnæ ⅓–½ in. broad, with copious parallel oblong or oblong-cylindrical adnate pinnules, the lowest ¼–⅓ in. long, the upper growing gradually shorter, all about $\frac{1}{12}$ in. diam.—On trees in the forests, Ocana, alt. 7000 feet,

1798 (105*). Acrostichum (Gymnopteris) juglandifolium, Baker, n. sp.—Rhizome wide-scandent. Stipe of the barren frond a foot long, naked, stramineous. Barren frond oblong-lanceolate, simply pinnate, 1½–2 feet long, subcoriaceous in texture, bright green and quite naked on both surfaces. Pinnæ lanceolate, upper sessile, lower shortly petioled, 5–6 in, long, 18–21 lin. broad, acuminate, subentire, rather cut away at the base in the lower half. Veins faint; main ones continuous from the costa of the pinnæ to the margin about ¼ in. apart, erecto-patent; veinlets 3–4-jugate, very ascending, simple, the groups regularly joining about a third of the way from the midrib to the edge. Fertile fronds bipinnate. Pinnæ lanceolate, 4–6 in. long, 1–1¼ in. broad, with spreading adnate ligulate-cylindrical pinnules a line broad, the lower ½–¾ in. long, growing gradually smaller towards the tip of the pinnæ.—On trees in the forests, 5000 feet. This and the two last are allied to one another, and to *A. insigne*, Baker, discovered lately by Father Sodiro in Ecuador. Except for the anastomosing venation they

come near two of Dr. Spruce's species from the north-east of Peru, *A. plumbicaule* and *A. fractiseriale*.

1678. *Schizæa digitata*, var. *orbicularis*, Baker.—Barren fronds almost circular, the main divisions about four times dichotomously forked, so that we have from 100 to 150 final segments, which are 1–1½ in. long, ½ lin. diam. Fertile frond deltoid, with corymbose ramification, the segments which bear the fertile pinnæ hardly at all flattened.—Dry hill-sides, 5000–6000 feet. Our attention was drawn to this many years ago by Mr. Whyte, of Medellin, who sent a photograph and numerous specimens. By its very dimorphic barren and fertile fronds, and the orbicular outline of the former, it looks very different in the extreme form from typical *digitata*, but it is evidently connected with the type by intermediate stages, as Fendler's No. 485 from Venezuela, and Wright's No. 926 from Cuba.

1352 (5*). Danæa serrulata, Baker, n. sp.—Stipe 2–3 in. long, minutely furfuraceous, and furnished with 1–2 joints. Barren lamina lanceolate, 6–9 in. long, 18–21 lines broad, simply pinnate, firm in texture, bright green and glabrous on both surfaces; main rachis obscurely winged. Pinnæ 15–20-jugate, sessile, lanceolate, unequal-sided, at most ¾–1 in. long, ¼–⅓ in. broad, reduced towards the base in the lower half, acute, regularly serrulate; lower pinnæ distant and much dwarfed. Veins crowded, very distinct, mostly simple. Fertile fronds much smaller, with ligulate entire pinnæ, the lower ½ in. long, ⅛ in. broad, shortly petioled.—Forest shade, 4000–5000 feet. Nearest *D. trichomanoides*, Spruce, from which it differs by its firm texture, and serrulate pinnæ of the barren frond, with close veining.

1815. Selaginella longissima, Baker, n. sp.—Main stem trailing to a length of 2 feet or more, very slender, unjointed, its deltoid ascending branches 6–9 in. long, with ascending simple upper and slightly compound lower branchlets, the ultimate divisions 2–2½ in. long, one-fifth of an inch broad. Leaves of the lower plane obliquely attached, close, bright green, ovate-oblong, acute, ⅛ in. long, the two sides not very unequal, the upper strongly ciliated towards the base. Leaves of the upper plane ⅓ as long, oblique-ovate, very ascending, obscurely cuspidate. Spikes terminal on the branchlets, square, 1–2 in. long, 1 lin. diam.; bracts ovate-lanceolate, erecto-patent, dark green, strongly keeled.—Forest shade, 3000 feet. Of familiar species this comes nearest *S. concinna* of Mauritius, and *S. radicata* of Tropical Asia.

1361. *Selaginella lingulata*, Spring.
1460. *S. mnioides*, A. Br.
1538. *S. Poppigiana*, Spring.
1331, 1350, 1379. *S. anceps*, A. Br.
1850. *S. Hartwegiana*, Spring.

FLORÆ SINICÆ NOVITATES TRES,

EDIT. HENR. F. HANCE.

1. POLYGALA (*Semeiocardium*) WATTERSII, sp. nov.—Tota, præter ramulos novellos racemorumque rachem glanduloso-tomentellos, glaberrima, caule lignescente superne parum ramuloso, foliis apicem versus aggregatis membranaceis elliptico-lanceolatis acuminatis margine recurvis 1–2½ poll. longis 4–11 lin. latis basi in petiolum 3–4 linealem cuneatim attenuatis supra opacis subtus glaucescentibus, floribus luteis in racemos 3 terminales laxos 10–15-floros folia haud superantes digestis, pedicellis filiformibus 3 lin. longis, sepalis deciduis 3 exterioribus oblongis obtusissimis 1½ lin. longis 2 interioribus petaloideis oblique oblongis 6 lin. longis, petalis alte coalitis lateralibus arcte imbricantibus 7½ lin. longis apice truncatis carinali apice inflato genitalia fovente vertice extus sacculos 2 parvos cuculliformes gerente, capsula compressa obovoidea ala angusta minutissime denticulata cincta apice emarginata basi persistente anulata sepalorum exteriorum fulta (adhuc immatura) 4 lin. longa.

Juxta urbem Ichang, prov. Hu-peh, m. Aprili 1880, legit amicus T. Watters, cui lætus dico. (Herb. propr. n. 21087.)

Pulchræ hujus et sane notabilis stirpis, ab omnibus ejusdem sectionis a Hasskarlio memoratis,* floribus magnis capsulæque forma certe distinctissimæ, unicum modo possideo exemplar, 5 pollices altum, sine radicis vestigio, adeo ut pro certo adfirmare non valeo caulem supra dictum non potius esse ramum majoris suffruticis: id tamen vix crederem, ex analogia specierum jam notarum indicium ferens.

2. SOPHORA (*Eusophora*) VICIIFOLIA, sp. nov.—Suffruticosa, ramis striatis glaberrimis, ramulis petiolisque adpresse tomentellis, foliolis 7-jugis cum impari brevissime petiolulatis obovatis retusis cum apiculo supra glaberrimis subtus parce hirtellis 5 lin. longis, stipulis tomentosis calloso-mucronatis, racemis ramulos foliatos terminantibus laxis recurvis 10–12-floris, floribus albis 6 lin. longis, calyce oblongo-campanulato adpresse tomentello lineali pedicello æquilongo suffulto dentibus brevibus triangulatis acutis 2 inferioribus paulo majoribus, petalis subæqualibus, filamentis per trientem fere longitudinis connatis, ovario adpresse sericeo.

In Chinensium prov. Hu-peh, circa urbem Ichang, m. Aprili 1880, leg. am. T. Watters. (Herb. propr. n. 21075.)

Affinis *S. flavescenti*, Linn., *S. Kronei*, mihi,† et *S. sororiæ*,‡ mihi; ab omnibus, foliolis parvis, obovatis, racemis lateralibus, recurvis, staminibus alte cohærentibus, facile distincta.

3. LORANTHUS (*Cichlanthus*) NIGRANS, sp. nov.—Ramulis foliis novellis utrinque adultis subtus petiolis pedunculis fructibusque

---

* In Miquel, Ann. Mus. Lugd.-Bat. i. 150.
† Ann. sc. nat. 4e. sér. xviii. 219.
‡ Ann. sc. nat. 5e. sér. v. 210.

tomento stellato pallide cinnamomeo vel fulventi tectis, foliis oppositis oblongo-ellipticis basi obtuse cuneatis apice obtusis coriaceis penniveniis supra in sicco lucidis nigris 2½–3½ poll. longis 13–15 lin. latis petiolo 3-lineali, pedunculis axillaribus 3–5 floris pedicellos duplo excedentibus, fructibus ovalibus pedicello triplo longioribus 3-linealibus.

Juxta urbem Ichang, prov. Hu-peh, Chinæ mediæ, in Quercubus et in *Lindera sericea*, Bl. tantum parasiticum, invenit am. T. Watters, m. Junio 1810. (Herb. propr. n. 21123.)

Lorantho chinensi, DC., vel saltem plantæ Hongkongensi hoc sub nomine a Benthamio descriptæ,—de cujus tamen identitate cum Candolleana haud forsan temere dubitat am Maximowicz,*—et præsertim *L. jadoriki*, Siebold, affinis. A priore,—floribus nostræ speciei nondum notis,—foliorum forma omnino diversa tomentoque persistenti distinctus, a posteriore etiam foliorum forma petiolisque brevibus dignoscendus. Ceteræ duæ species chinenses a me olim descriptæ pertinent, secundum novissimam sectionum recensionem in opere egregio quod inscribitur 'Genera Plantarum' datam, *L. Sampsoni* ad *Heteranthum*, *L. bibracteolatum* ad *Dendrophthœum*.

NOTES ON THE FLORA OF DERBYSHIRE.

By the Rev. W. H. Painter.

As no complete record of the Flora of Derbyshire has been published, it is hoped that the following notes may stimulate the Botanists living in that county to investigate and record its plant-life.

Owing to the geological formations of the county, its Flora is an extensive and interesting one. In the northern portion of it we have a wild moorland tract of country, resting upon the rocks of the Millstone Grit Series, of which Kinder Scout (1981 ft.), Cowburn (1816 ft.), Axe Edge (1751 ft.), and Mam Tor (1709 ft.) are its highest points, with a subalpine Flora. These rocks extend from Glossop on the north to Duffield, near Derby, on the south.

Beneath the Millstone Grit lie the Yoredale Rocks, which are well exposed in the ravines on the flanks of Kinder Scout and the other hills. The shales of this series have a rich flora.

But the richest of all the geological formations is that of the Carboniferous Limestone, which, commencing near Castleton and Buxton, underlies the greater part of the county, and terminates at Matlock Bath, with outliers at Crich Hill, and Ticknall on the borders of Leicestershire.

The Coal-measures extend from Sheffield on the north to within six miles of Derby; and parallel with these to the eastward is a broad band of Magnesian Limestone. The Flora of these parts has not been thoroughly investigated.

---

* Mém. biolog. Acad. St. Pétersb. ix. 611.

Southwards of Derby is a broad plain resting upon Triassic rocks, through which the Rivers Trent and Derwent flow on their way to the ocean. These are the principal rivers of Derbyshire, though there are others more celebrated for their beauty, *viz.*, the Dove, the Wye, the Lathkill, the Goyt, and the Dane.

For botanical purposes the county may be thus divided into four districts:—I. The Peak district, in which are the principal moorlands and dales; II. The Coal-measures; III. The Magnesian Limestone; and IV. The district south of Duffield and Ashbourne.

The compiler of this list desires to express his great obligations to the Revds. Gerard Smith, of Ockbrook, Derby, and W. H. Purchas, of Alstonfield Vicarage, Ashbourne; to Messrs. Harris, of Burton-on-Trent; Haggar, of Repton; Hannan, Searle, and Whitelegg, of Ashton-under-Lyme; C. Bailey, F.L.S., of Whalley Range; Wild, of Manchester; J. E. Sunderland, of Stockport; Whittaker, of Morley, Derby; who have greatly assisted him with specimens, and who are responsible for the habitats against which their names are placed. He has also to thank the two first-named gentlemen, together with J. G. Baker, Esq., F.L.S., of the Royal Gardens, Kew; and Mr. J. E. Bagnall, of Birmingham, for examining critically the specimens submitted to them.

All the specimens recorded in the following list have passed through the hands of the writer of this article, and where no authority is given for a habitat, he is responsible for the same, the mark ! being placed against the same. As several plants are recorded in 'Topographical Botany' as having been found in the county which have not passed through the hands of the writer, a supplementary list of the same will be given at the close of this article.

The arrangement followed is that of the 'London Catalogue of British Plants,' Ed. VII.

Thalictrum minus, Linn.; *montanum*, Wallr. I. Monsal Dale, *Bailey*; Cave Dale, Castleton, *West*; Cressbrook Dale!

T. flexuosum, Bernh. I. Cave Dale, Castleton, *West*; The Winnatts, Castleton!

T. flavum, Linn.; *sphærocarpum*, Bosw. I. Monk's Dale, Wormhill, *West*. IV. Common about Burton-on-Trent, *Harris*.

Anemone nemorosa, Linn. Common.

Myosurus minimus, Linn. IV. Drakelowe, Stapenhill, *Harris*.

Ranunculus fluitans, Linn. IV. River Derwent, Darley Abbey; Derby! common about Burton-on-Trent, *Harris*.

R. peltatus, Fries. I. Baslow and Monyash, *Bailey*. IV. Old bed of Derwent, Litchurch, Derby!

R. floribundus, Bab. I. Farley Paddocks, Baslow, *Bailey*; Ponds at Boulton, Derby!

R. penicillatus, Schur. I. Lathkill Dale, Monsal Dale, *Bailey*; Dove Dale and Miller's Dale!

R. Lenormandi, Schultz. I. Kinder Scout, *West*; Coombes Moss, near Buxton!

R. hederaceus, Linn. IV. Milton, Repton, *Playne*; Repton Rocks, *Haggar*; Breadsall, near Derby, *Whittaker*; common near Burton-on-Trent, *Harris*.

R. sceleratus, Linn. IV. Common about Burton-on-Trent, *Harris*; Borrowash Railway Station!

R. Flammula, Linn. Boggy places, common.

R. auricomus, Linn. IV. Common about Derby.

R. acris, Linn. Very common.

R. repens, Linn. Very common.

R. bulbosus, Linn. Very common.

R. arvensis, Linn. IV. Common.

R. Ficaria, Linn. Very common.

Caltha palustris, Linn. Very common.

Trollius europæus, Linn. I. Chee Tor and Brassington Rocks, *Purchas*; between Miller's Dale and Litton, *Hannan*.

Helleborus viridis, Linn. I. Wormhill, Buxton, *West*; near Dove Dale, *Searle*; Lathkill Dale, *Whitelegg*. II. Near Codnor Park, *Smith*. IV. Plantation at Drakelowe, *Harris*.

H. fœtidus, Linn. I. Cromford, *Whittaker*; Bakewell, *Smith*.

Aquilegia vulgaris, Linn. I. Monsal Dale, *Whitelegg*; Cressbrook Dale! Bakewell, *Smith*. IV. Drakelowe, *Harris*; Willington, *Hagger*.

Berberis vulgaris, Linn. IV. Morley-near-the-Church and Boulton-near-the-Church, *Whittaker*; occasional near Burton-on-Trent, *Harris*.

Nuphar lutea, Sm. IV. River Trent, *Harris*; Swarkestone Bridge!

Papaver Rhœas, Linn. IV. Linton and Cauldwell, *Harris*; about Derby!

P. dubium, Linn.; *Lamottei*, Bor. I. Duffield, *Bland*; Baslow, *Bailey*. IV. Linton and Cauldwell, *Harris*; Repton!

P. Argemone, Linn. IV. Morley, *Whittaker*; Repton, *Playne*; Linton and Cauldwell, *Harris*.

Chelidonium majus, Linn. I. Over Haddon, *Bailey*; Matlock Bath! IV. Common about Burton-on-Trent, *Harris*; Stenson, near Derby!

Corydalis lutea, DC. I. Wormhill, *West*; Crich, *Whitelegg*; Matlock Bath!

C. claviculata, DC. I. Ambergate, *Harris*. IV. Morley Moor!

Fumaria officinalis, Linn. Common.

Raphanus Raphanistrum, Linn. IV. Stapenhill, *Harris*.

Sinapis arvensis, Linn. Common.

Brassica Rapa, Linn.; *sylvestris*, Linn. I. Dove Dale! IV. Morley!

Sisymbrium officinale, Scop. Common.

S. Alliaria, Scop. Common.

Hesperis matronalis, Linn. I. Miller's Dale, *Whitelegg*.

Cardamine amara, Linn. I. Via Gellia! IV. Common, Burton-on-Trent, *Harris*; Breadsall! Kedleston!

C. pratensis, Linn. Common.

C. hirsuta, Linn. Common.

C. sylvatica, Link. I. Stirrup Wood, Glossop, *Whitelegg*. IV. Burton-on-Trent, *Harris*; Mackworth, near Derby!

C. impatiens, Linn. I. Chee Dale, *West*; Lathkill Dale, *Bailey*; Matlock Bath, *Smith*; Via Gellia! Dove Dale! IV. Bretby, *Harris*.

Arabis thaliana, Linn. Common.
A. perfoliata, Lam. IV. Drakelowe, *Harris*.
A. hirsuta, *Brom*. Common on limestone rocks.
Barbarea vulgaris, Br. Common.
Nasturtium officinalis, Br. Common.
N. sylvestre, Br. IV. Old bed of Derwent, Derby!
N. amphibium, Br. IV. R. Trent, Stapenhill, *Harris*; old bed of Derwent, Derby!
Cochlearia officinalis, Linn. I. Wirksworth, *Harris*; Winnatts, Castleton!
C. alpina, Watson. I. Between Peak Forest and Castleton, *West*.
Draba verna, Linn. Common.
D. muralis, Linn. I. Miller's Dale, *West*; near Lathkill Dale, *Whitelegg*; Hartington, *Purchas*; Matlock Bath, *Rowlands*; Via Gellia, near Matlock Bath!
D. incana, Linn. I. Miller's Dale, *Bailey*; Monk's Dale, *West*; Monsal Dale!
Thlaspi arvense, Linn. IV. Stapenhill, *Harris*.
T. alpestre, Linn. I. Matlock, *Smith*.
T. virens, Jord. I. Youlgreave, *A. S. Ley*; Heights of Abraham, Matlock Bath, *Harris*; Wirksworth, *Whitelegg*; Via Gellia, near Matlock Bath!
Iberis amara, Linn. I. Railway embankment, Monsal Dale, *Bailey*.
Hutchinsia petræa, Br. I. Miller's Dale, *Whitelegg*; Chee Dale, *West*; Dove Dale, *Harris*; beneath railway viaduct, Monsal Dale!
Capsella Bursa-pastoris, Mœnch. Common.
Senebiera Coronopus, Poir. IV. Burton-on-Trent, *Harris*.
Reseda Luteola, Linn. I. Matlock Bath, *Hannan*. IV. Bretby, *Harris*; Old Quarry, Stanton-by-Bridge!
Helianthemum vulgare, Gaert. I. Common on limestone hills!
Viola palustris, Linn. I. Axe Edge, *West*. IV. Allersley Park, near Derby; Horsley Car, *Whittaker*; Repton Rocks, *Playne*.
V. odorata, Linn. IV. Morley, near Derby, *Whittaker*; common about Burton-on-Trent, *Harris*. Var. *alba*. IV. Morley, near Derby, *Whittaker*; Repton, *Hagger*; Burton-on-Trent, *Harris*.
V. hirta, Linn. I. Cromford, *Harris*; Monsal Dale!
V. sylvatica, Fries; var. *Riviniana*, Reich. IV. Ockbrook, near Derby!
V. canina, Auct. IV. Ockbrook!
V. tricolor, Linn. Common.
V. lutea, Huds. I. Wardlow Hay Cop, *Bailey*; Mam Tor and Peak Forest, *West*; Matlock Bath, *Smith*; Wirksworth, *Harris*; Chelmorton Low, near Buxton, and Via Gellia, Matlock Bath! Var. *amœna*. I. Miller's Dale, *Whitelegg*; Wirksworth, *Harris*.
Polygala vulgaris, Linn. Heaths, common.
P. oxyptera, Reich. I. Miller's Dale, *Whitelegg*.
Dianthus deltoides, Linn. I. Quarry near Newhaven, *Bailey*.
Silene inflata, Sm. I. Monsal Dale! Ashford-in the-Water! Var. *puberula*, Jord. I. Matlock Bath, *Whitelegg*; Monsal Dale, *Bailey*.

S. nutans, Linn. I. Monsal Dale, *Bailey*; Miller's Dale, *West*; Bakewell, *Harris*; Dove Dale!

S. noctiflora, Linn. IV. Gresley, Linton, Cauldwell, *Harris*.

Lychnis vespertina, Sibth. Common.

L. diurna, Sibth. Common.

L. Flos-cuculi, Linn. Common.

L. Githago, Desf. IV. Morley, *Whittaker*; Repton, *Hagger*; near Burton-on-Trent, *Harris*; Ockbrook, *Smith*.

Cerastium semidecandrum, Linn. I. Monsal Dale, *Whitelegg*; Matlock Bath, *West*. IV. Near Burton-on-Trent, *Harris*.

C. glomeratum, Thuill. Common.

C. triviale, Link. Common.

Stellaria aquatica, Scop. IV. Newton Solney, *Harris*; Chaddesden and Osmaston, near Derby!

S. nemorum, Linn. I. Wood at Mellor, *Wild*.

S. media, With. Common.

S. Holostea, Linn. Common.

S. graminea, Linn. Common.

S. uliginosa, Mürr. Common in wet places.

Arenaria trinervia, Linn. Common on banks.

A. serpyllifolia, Linn. Common walls.

Alsine verna, Bartl. I. Peak Forest, *West*; Youlgreave, *Bailey* Cromford and Matlock Bath, *Harris*; Castleton! Via Gellia!

A. tenuifolia, Crantz. I. Miller's Dale, *Bailey*.

Sagina apetala, Linn. I. Dove Dale, *Purchas*. IV. Ticknall *Purchas*; near Knowle Hills, *Hagger*; Repton!

S. ciliata, Fries. I. Dove Dale, *Purchas*; Whatstandwell on walls, *Whitelegg*.

S. procumbens, Linn. Common.

S. nodosa, Meyer. I. Marple, *Whitelegg*; Buxton! IV. Repton Rocks, *Harris*.

Spergula arvensis, Linn. Common.

Spergularia rubra, Fenzl. I. Baslow, *Bailey*. IV. Repton, *Playne*; Foremark, *Harris*.

Scleranthus annuus, Linn. III. Ticknall, *Harris*; Repton Rocks, *Hagger*; Breadsall Moor, near Derby!

Montia fontana, Linn. I. Charlesworth Coombs, *Hannan*; Manchester Road, Buxton! IV. Cauldwell, *Harris*; Ripton Rocks, *Hagger*.

**Claytonia alsinoides*, Linn. I. Near Bakewell, *West*.

Hypericum perforatum, Linn. I. Buxton, *Bailey*; Matlock Bath, *Hannan*; Dove Dale! IV. Common!

H. tetrapterum, Fries. I. Dove Dale. IV. Repton!

H. humifusum, Linn. I. Ashford-in-the-Water, *Bailey*; Edensor, *Wild.*; Hadfield and Glossop, *Hannan*; Dove Dale! IV. Common about Burton-on-Trent, *Harris*.

H. pulchrum, Linn. I. Mellor, *Hannan*; Dove Dale! Miller's Dale! IV. Common about Burton-on-Trent, *Harris*.

H. hirsutum, Linn. I. Ashford-in-the-Water, *Bailey*; Lover's Leap, Buxton! Dove Dale!

H. montanum, Linn. I. Miller's Dale; Crich, *Searle*; between Buxton and Bakewell, *Smith*; Wormhill; Monsal Dale, *West*; Winshill, *Harris*! Dove Dale!

Malva moschata, Linn. I. Hassop, *Bailey*; Matlock, *West*; Dove Dale! IV. Duffield!

M. sylvestris, Linn. I. Crich, *Whitelegg*. IV. Common about Burton-on-Trent, *Harris*; Swarkestone!

M. rotundifolia, Linn. I. Miller's Dale, *Whitelegg*; Thorpe Cloud, Dove Dale! IV. Willington, *Hagger*; Repton!

Linum catharticum, Linn. Common.

Geranium sanguineum, Linn. I. Miller's Dale, *Harris*; Monk's Dale, *West*; Cressbrook Dale, *Whitelegg*.

G. phæum, Linn. IV. Morley, *Whittaker*.

G. pratense, Linn. Common.

G. pyrenaicum, Linn. I. Hassop, *Bailey*.

G. molle, Linn. Common.

G. dissectum, Linn. Common.

G. columbinum, Linn. I. Miller's Dale, *Bailey*; Dove Dale!

G. lucidum, Linn. I. Miller's Dale, *Bailey*; Dove Dale! IV. Bretby, *Harris*.

G. Robertianum, Linn. Common.

Erodium cicutarium, L'Herit. IV. Foremark, *Harris*; Stanton-by-Bridge!

Oxalis Acetosella, Linn. Common.

**Impatiens parviflora*, DC. I. Matlock Bath, *Searle*. IV. Ockbrook, *Smith*.

Ilex Aquifolium, Linn. Common.

Euonymus europæus, Linn. I. Miller's Dale; Cressbrook Dale, *Whitelegg*. IV. Winshill, *Harris*.

Rhamnus catharticus, Linn. I. Monk's Dale and Matlock, *West*; Miller's Dale, *Bailey*; Cressbrook Dale, *Whitelegg*; Dove Dale, *Purchas*. IV. Breadsall, *Whittaker*.

R. Frangula, Linn. IV. Horsley Car, near Derby, *Whittaker*; Drakelowe, *Harris*.

Acer campestre, Linn. I. Ashford Dale, *Whitelegg*; Miller's Dale, *Wild*; Dove Dale! IV. Common about Burton-on-Trent, *Harris*.

Ulex europæus, Linn. Common.

U. Gallii, Planch. I. Goyt's Bridge, Buxton! IV. Gresley, *Harris*.

Genista tinctoria, Linn. I. Matlock Bath, *Bailey*. IV. Ockbrook, *Smith*; Burton-on-Trent, *Harris*.

Sarothamnus scoparius, Koch. Heaths, common.

Ononis spinosa, Linn. IV. Normanton-by-Derby!

O. arvensis, Auct. I. Passing into *spinosa*, Baslow, *Bailey*; common about Derby!

Anthyllis Vulneraria, Linn. I. Miller's Dale, *West*; Dove Dale! IV. Measham, Harris.

Medicago lupulina, Linn. Common.

Melilotus officinalis, Willd. IV. Bretby, *Harris*; Nottingham Road Railway Station, Derby! Challaston!

Trifolium pratense, Linn. Common. Var. *sativum*, Syme. I. Miller's Dale, *Bailey*. IV. Burton-on-Trent, *Harris*.

T. medium, Linn. I. Buxton; and IV. Ockbrook, *Smith*.

T. arvense, Linn. IV. Burton-on-Trent, *Harris*; Repton.

T. striatum, Linn. I. Monsal Dale, *Whitelegg*; Miller's Dale, *Bailey*. IV. Drakelowe, *Harris*.

T. repens, Linn. Common.

T. procumbens, Linn. I. Turnditch! Dove Dale! IV. Burton-on-Trent, *Harris*.

T. minus, Relhan. IV. Burton-on-Trent, *Harris*; Repton!

T. filiforme, Linn. I. Miller's Dale, *Wild*. IV. Burton-on-Trent, *Harris*.

Lotus corniculatus, Linn. Common.

L. major, Scop. I. Dove Dale; IV. Burton-on-Trent, *Harris*; Repton!

Ornithopus perpusillus, Linn. IV. Cauldwell, *Harris*; Morley Moor! Quarndon!

Hippocrepis comosa, Linn. I. Dove Dale!

Vicia hirsuta, Koch. I. Miller's Dale, *West*. IV. Drakelowe, *Harris*; Spondon and Morley, near Derby!

V. tetrasperma, Mœnch. I. Miller's Dale, *Wild*; IV. Drakelowe, *Harris*; Repton, *Hagger*.

V. Cracca, Linn. Common.

V. sylvatica, Linn. I. Cressbrook Dale, *Bailey*; Lathkill Dale, *Whitelegg*; Matlock Bath, Ashbourne, *Smith*.

V. sepium, Linn. Common.

V. sativa, Linn. Common.

V. angustifolia, Roth. I. Turnditch! IV. Gresley, *Harris*.

(To be continued).

GENERIS *CORNI* SPECIES DUAS NOVAS CHINENSES,

PROPONIT HENR. F. HANCE, PH.D.

1. CORNUS (*Thelycrania*) CRISPULA, sp. nov. — Arbuscula cortice nigricante, ramis oppositis obscure angulatis, foliis oppositis tenuiter papyraceis ovato-ellipticis margine crispulo-undulatis basi plerumque inæqualibus acutis apice in acumen falcato-caudatum sensim productis supra sublucidis pilis minutis bipartitis adpressis conspersis sub lente tantum conspicuis subtus pallidioribus pilis minutis bipartitis adpressis sub lente tantum conspicuis confertim obtectis costulis utrinque 5 (marginalibus inclusis) tenuibus subtus tantum prominulis percursis 2–3½ poll. longis 1–1½ poll. latis petiolo 4–15 lineali, cymis multifloris paniculatis effusis convexis 2–2½ poll. diametro, calycis tubo cano-sericeo dentibus brevissimis acutis discum capulatum undulatum pilosulum haud superantibus, petalis oblongis acutis, stylo cylindraceo stigmate capitato coronato.

In collinis circa Chin-Kiang, prov. Kiang-su, ineunte Aprili 1880 coll. Bullock. (Herb. propr. n. 21132.)

2. CORNUS (*Thelycrania*) PAUCINERVIS, sp. nov. — Frutex 5–6 pedalis cortice rufo-brunneo, ramis oppositis quadrangulatis, foliis oppositis rigide membranaceis elliptico-lanceolatis basi cuneatis apice acutis supra opacis pilis minutis adpressis consitis subtus pallidis pilis bipartitis adpressis oculo tantum armato perspiciendis

tectis costulis utrinque 3 (inclusis marginalibus) supra impressis subtus elevatis percursis 1½–2½ poll. longis ¾–1 poll. latis petiolo 2–3 lineali, cymis multifloris depressis 1–1½ poll. diametro pilosis, calycibus dentibus triangulatis tubo piloso brevioribus discum cupulatum undulatum leve parum excedentibus, petalis oblongis acutis, stylo apice valde incrassato stigmate capitato coronato.

Juxta oppidum Liu-chau-fu, prov. Kwang-si, d. 19. Junii 1879 coll. W. Mesny; circa Ichang, prov. Hu-peh, m. Junio 1880 invenit T. Watters. (Herb. propr. n. 21237.)

Species duas supra descriptas cum plerisque e civitatibus fœderatis Americæ septentrionalis comparavi, necnon cum asiaticis *C. alba*, Linn. (Jehol, David!), et *C. brachypoda*, C. A. M. (Nagasaki, Oldham 467!), a quibus omnibus abhorrent; *C. australem*, C. A. M. nondum vidi. Prior, *C. paniculatæ*, Lhér. proxime affinis, differt foliis majoribus, latioribus, ovato-ellipticis, subtus haud tuberculatis, longius petiolatis, cymis laxioribus, cet; posterior foliis rigidis, paucicostulatis, præsertim insignis, *C. asperifoliæ*, Mx. accedit.

SHORT NOTES.

Littorella lacustris, *L.*, in Oxfordshire.—In a pool on what remains of Woodcote Heath, near Goring, in the above county, I was glad to meet with a quantity of *Littorella lacustris*, a previously unrecorded plant for Oxfordshire. A neighbouring pool contained *Peplis Portula*, also rare in the county, while a third and deeper one nearing Goring was nearly full of *Potamogeton serratus*, Huds.; one or two of the older plants, however, showing faintly crisped leaves.—G. C. Druce.

Gnaphalium dioicum in Cornwall.—This is an extremely rare and local plant in East Cornwall. I came across a patch of it with about eighteen flower-stalks (female plant) on May 30th. The station is near the 200 yards' firing point of the Bodmin Rifle Range, Cardinham. I could find no vestige of it on other parts of the down, but was prevented from making a thorough search, as the annual prize shooting of the volunteers was going on at the time. This I believe to be the first notice of it for the district, and it is the only station known to me.—W. Wise.

Botrychium Lunaria in Shropshire.—There are so few records of the occurrence of *Botrychium Lunaria* in Shropshire that a new locality is worthy of notice. In my list of the Ferns of the county, published in the 'Transactions of the Shropshire Archæological and Natural History Society' for 1877, four localities were given, each on the authority of gentlemen long since dead. Since that date this plant has been found by Mrs. Auden between Preston

Montford and the village of Ford. I have now to add the sixth locality, having quite recently seen it growing in Petton Park, the seat of W. Sparling, Esq., in considerable quantity. It may be that its small size, and the readiness with which it is eaten by sheep and cattle, may account for it not being more frequently detected.—William Phillips.

Notices of Books and Memoirs.

Peruvian Bark; a popular account of the introduction of Chinchona cultivation into British India. By Clements R. Markham, C.B., F.R.S. 1860—1880. With maps and illustrations. London: John Murray. 1880. 8vo, pp. xxiii., 550.

This thick octavo volume is divided into two Parts and an Appendix:—Part I. Collection of *Chinchona* plants and seeds in South America, comprising pages 1 to 258, includes the early history of the bark, the various descriptions met with in commerce and their derivation, with the narrative of Mr. Markham's journeys and their successful issue. Part II. Introduction of *Chinchona* plants and seeds into British India, extends to page 440, followed by an Appendix on Caoutchouc, Peruvian Cotton, Cuzco Maize and Quinua, a "Bibliography of the *Chinchona* Genus" extending from pp. 487 to 516, and the volume closes with a good index.

We must confess that we are not greatly surprised at, however much we may regret, the bitter language used in speaking of the comparative neglect shown by the Government at home and in India, to those fellow-labourers of the author in the beneficent mission with which they were charged. Mr. Markham's appointment was at first objected to, on the plea that he was no botanist, but his lack in this respect was well supplied by others, and his knowledge of the country and languages stood him in admirable stead. The difficulties surmounted were great, and the present commercial success of the enterprise might have induced the authorities to deal with greater liberality towards those who sacrificed their own health, in order to secure that blessing to others.

The bibliography is disappointing; after the first glance, it bears evident marks of haste and want of care in the compilation. Worse still, the author has actually ventured to spell *Cinchona* and its derivatives in his own fashion throughout, thus mutilating the majority of titles. Having thereby shown himself wanting in the first requisite of a bibliographer, namely, a scrupulous love of accuracy, it is not remarkable that other faults should occur. The list is far from complete, and a little additional trouble would have added much to it. For example:—

"Royle, Dr. Forbes, M.D., a Manual of Materia medica and Therapeutics. Article '*Chinchona*.' (London, 1847, 8vo.

2nd ed. 1853. 3rd ed. 1856. American ed. by J. Carson, M.D., Philadelphia, 1847). The *Chinchona* article was printed separately." (Page 513).

We can supply the omitted information that eds. 4 and 5 were issued in 1864 (dated 1865) and 1868 respectively, and treat of the article *Cinchona*. Some medical authors, like the foregoing, have double honours paid to them; and some, like "Lindley, J." (p. 504), pass unrecognised.

"Endlicher, Stephen. Genera plantarum secundum ordines naturales deposita. (Vindobonæ, 1836—48)."

There being no reference to the particular page containing the description of the genus *Cinchona*, the unversed reader might conclude that that genus was continued through the entire work, which, of course, is not the case; moreover, let the foregoing be compared with the copy of the title-page given below; errors in name, title, and date will be noticed.

"Genera plantarum secundum ordines naturales disposita. Auctore Stephano Endlicher. Vindobonæ, 1836—1840."

The Mantissæ and Supplementa bring the dates of the complete work down to 1850. In a similarly general way we find DC. Prod., "1824—48," and Roemer and Schultes cited. Under the heading Linnæus, only the first edition of the 'Species Plantarum' and 'Genera' are given, although the sixth edition of the latter is specifically quoted on page 12; we may here point out how clearly *Cinhona* in this edition is a press error, by mentioning that it is correctly spelled *Cinchona* in the Index, and attention called to it in the Errata. . Another cause for surprise is that the treatise "De Cortice peruviano," which is printed in the 'Amœnitates academicæ,' and speaks of the Viceroy as "Comès del Chinchon," does not figure in the Bibliography.

"Aimé-Bonpland" would mislead those who did not know Bonpland's Christian name was Aimé. "Lambert-Aylmer, Bourke," is another blunder (p. 503), and emphasised by repetition on the next page. "Miquel, Friederich Anton Wilhelm" is decidedly faulty, for his one work quoted bears his name in a Latinised form, whilst his native names were Dutch, not German; a little of the "chivalrous" consideration shown elsewhere would not have been out of place here. "Pavon; Don José" (p. 510), like the rest of the Spanish authors, is graced with his title of honour, but "Humboldt, Albr. von," appears untitled.

We have already commented on such double Doctoring as "Macpherson, Dr. D., M.D." The entry "*Graf.* — Die Fieberrinden, 1824," which looks suspiciously like a cutting from an old book catalogue, is not a mistake of a title for a name, but merely a very curt allusion to—

"Graf (Sigmund), Die Fieberrinden in botanischer, chemischer und pharmaceutischer Beziehung dargestellt. Wien, 1825. 8vo."

Some of the headings are open to objection; De la Condamine is preferably styled La Condamine, and so forth.

A few words now on Mr. Markham's obstinate contention for *Chinchona* versus *Cinchona*. We notice that an argument formerly

employed is now silently abandoned, namely, that *cinchón*, meaning a broad girdle, the name in use commemorates a policeman's belt rather than a noble lady. If that argument were worth anything, we should be compelled to remodel the majority of generic names forthwith; for instance, *Adoxa*, besides the original meaning of the word, may be applied to a class of persons by no means worthy of honour. Our author's persistent error seems to arise from the fact that his attention in Botany has been solely devoted to one genus, and having looked at the matter from that narrow standpoint only, he has not grasped the subject in its larger aspect. The fact is unquestioned and unquestionable, that Linnæus did first publish the genus as *Cinchona*, adhered thereto, and it will remain as such. A name once published becomes the common property of the scientific world; therefore, not even the author is at liberty to alter the name bestowed by himself, or, in other words, to mutilate that which belongs to the commonwealth. Mr. Markham, we fear, is wilfully blind to the utter confusion inevitable were his plea for tinkering names seriously entertained. Commemorative designations can rarely be more than approximations to the names of the persons they are intended to honour. Thus, *Goodenia*, Sm., is named after Samuel Goodenough, and *Gundelia*, Tourn., after Andreas Gundelsheimer; and, more striking still, *Desfontainea*, Ruiz & Pav., *Desfontainesia*, Hoffmansegg, *Fontanesia*, La Bill., and *Louichea*, L'Hér., are all derived from Réné Louiche Desfontaines. These examples are enough to demonstrate how utterly foolish any attempt would be to alter these names for Mr. Markham's reasons.

A reviewer in a contemporary, apparently deriving his knowledge of the subject entirely from the volume before us, for he uses its very words, oracularly declares that the genus ought to be called universally *Chinchona*. Had this writer only referred to the file of the journal in which his notice appeared, he would have found a letter from the late Daniel Hanbury, which mercilessly exposes Mr. Markham's fallacies and misstatements.* Hanbury and Weddell are no longer with us, and they therefore cannot repudiate the spelling imputed to them in the pages of this book, but those who knew and honoured them in life must be pained as we are, to find their very words maltreated in a fashion which they, while living, so strenuously opposed. B. D. J.

Rabenhorst's Kryptogamen-Flora von Deutschland, Oesterreich und der Schweiz. Erster Band: Pilze. Von Dr. G. Winter: 1 & 2 Lieferungen. 1881. (Kummer, Leipzig).

Since the first edition of this book was published, in 1844, the study of Cryptogamic Botany has advanced so far that to bring out a new edition of it now is in effect to write a new book. The first two parts of the first volume (devoted to Fungi) have been issued by Dr. G. Winter. It is especially in this branch of the study that

* 'The Athenæum,' January 30th, 1875, pp. 162, 163.

the advance in our knowledge has taken place. The orders treated of are the *Schizomycetes*, *Saccharomycetes*, *Basidiomycetes* (fam. *Entomophthoreæ* and *Ustilagineæ*), and the *Uredineæ*. Dr. Winter has already made known his peculiar opinion as to the classification of Fungi (*Hedwigia*, 1879, No. 1), and perhaps this is not now the occasion to criticise it; but it is difficult to pass by such expressions as "the yet open question of the sexuality of the *Ascomycetes*" without a strong desire to do so. However, for such an act as the sinking of the genera *Æcidium*, *Uredo*, &c., one cannot but feel grateful. There is a useful introduction to the study of Fungi, in which there is an unfortunate chapter on the preservation and the preparation of Fungi for examination. To give deliberate directions for squeezing the cover-glass (and distorting the object beneath it) is to teach a method of examination (surviving from the days of the regular use of the "compressorium"), which is not only productive of very great error, but is totally unnecessary in the study of Fungi or of any vegetable organisms. The illustrations are very coarse woodcuts. The book, however, gives promise of containing a fair amount of useful information on the groups with which it deals. G. M.

Articles in Journals.—May.

Ann. des Sc. Nat. (Botanique), sér. vi. t. x., n. 6 [dated March]. —E. Bescherelle, 'Bryological Flora of Reunion' (concluded).—M. Maquenne, 'Researches on the diffusion, absorption, and emission of heat by leaves.'— E. Prillieux, 'Alterations produced in Plants by cultivation in an over-heated Soil' (2 plates).—P. Sagot, 'Catalogue of French Guiana Plants.'——(t. xi., nos. 1 & 2).—L. Olivier, 'Researches on the tegumentary structure of Roots' (8 plates).

Botanical Gazette.—J. T. Rothrock, 'Modes of Work in Prof. de Bary's Laboratory' (continued). — T. C. Porter, '*Audibertia Vaseyi*, sp. n.'—W. K. Higley, 'Experiments on Carnivorous Plants,' (contd.)— M. E. Banning, 'Maryland Fungi' (continued).— F. L. Harvey, 'Ferns of Arkansas' (concluded).

Bot. Zeit.—G. Klebs, 'On the lower forms of *Algæ*' (continued).

Bot. Notiser.—K. F. Dusén, 'On the Flora of Medelpad.'—N. H. Nilsson, '*Potentilla Fragariastrum*'—F. Behm, 'Researches on the Flora of Jemtland.'—C. Melander, 'Journey in Lappmark in 1880.'

Bulletin of Torrey Bot. Club.— C. H. Peck, 'Two new Fungi:' *Ascomycetella* (gen. nov.) *quercinæ*, *Polyporus* (*Merisma*) *lactifluus*. —J. B. Ellis & H. W. Harkness, 'New North American Fungi' (contd.): *Sphæronema capillare*, *Sporodesmium Ranii*, *Mytilinidion californicum*, *Sphæria consociata*.—J. C. Arthur, 'The Lapham Herbarium.'—G. Hespell, 'Preparation of Pileate Fungi for Herbarium.'

Midland Naturalist.—J. E. Bagnall, 'Flora of Warwickshire' (contd.)

Œsterr. Bot. Zeitschrift.— E. v. Halácsy, '*Orchis Braunii* (*latifolia maculata*).' — H. Steininger, 'Flora of the Bodenweis.'— H. v. Borbás, 'On Plants with abnormally verticillate leaves.'—

B. Blockie, 'Remarks on some Plants of Schur's 'Herbarium Transsilvanicum.'— P. Sintenis, 'Cyprus and its Flora.'— P. G. Strobl, 'Flora of Etna' (contd.)

Proceedings of Societies.

Linnean Society of London.

Anniversary Meeting.—May 24.—Prof. Allman, LL.D., F.R.S., President, in the chair.—There was a very numerous attendance of the Fellows.—The Treasurer (Mr. Fredk. Currey) read his Annual Report, stating that financially the Society continued prosperous. The invested capital at the present date is £3868 4*s.* 6*d.*, the sum of £140 derived from Fellows' Life Compositions during the past twelvemonths having been invested in consols. The balance at the bankers at the end of the financial year (30th April) was £532 0*s.* 10*d.*, and at the bankers and on hand at this date (24th May) £604 15*s.* 10*d.* The annual contributions amounted to £928 4*s.*, and sales of publications to £230 19*s.* 7*d.*; there was an increase in the admission fees, and decrease in the compositions. £104 8*s.* 3*d.* had been expended on the purchase of books for the library, and £48 1*s.* 11*d.* towards bookbinding and stationery; £765 18*s.* 2*d.* had been spent on the Society's publications. A donation of £50 had been made by Mr. G. Bentham.—The Secretary (Mr. B. Daydon Jackson) then read his Report. Since the last anniversary eleven Fellows of the Society had died, and four had withdrawn. Against this thirty-seven new Fellows had been elected, besides one Foreign Member and one Associate. As the Society at present stood, there were 670 Fellows, 50 Foreign Members, and 21 Associates, *viz.*, a total of 741. During the past year there had been received as donations to the library 106 volumes, and 125 pamphlets and separate impressions of memoirs; from the various scientific societies there had also been received 96 volumes and 248 detached part of publications, besides 23 volumes of donations from the editors of independent periodicals. The council, at the recommendation of the library committee, had sanctioned the purchase of 80 separate volumes and 63 serials and parts of important works, continuations and otherwise, these latter equal to about 10 vols., or 90 in all by purchase: the total addition to the library, therefore, being 315 vols. and 373 separate parts. Mr. Kippist had also given, as a donation, framed water-colour sketches of Robert Brown's birthplace and London residence, and of Sir J. Banks's library. The Society's collections and herbaria had been duly examined and reported on to the council as in good condition. After a service of fifty years, Mr. Kippist had resigned his position as Librarian to the Society, and the council, in acknowledgment thereof, had granted him a retiring pension.—Mr. Baker, in the name of Mr. J. W. Miers, then presented to the Society a

portrait of his father, the late John Miers, as a memento of his connection therewith.—Prof. Allman then delivered his anniversary address, the subject chosen being "Recent advances in our Knowledge of the Development of the *Ctenophora*."—The Secretary afterwards read obituary notices of the several Fellows who had died during the year, making special mention of the life and labours of Mr. E. R. Alston, the late Zoological Secretary; Mr. John Gould, the ornithologist; Mr. Gerard Krefft, of Sydney; Dr. W. Lauder Lindsay, and Mr. R. A. Pryor, of Baldock, Herts.—The scrutineers, having examined the ballot, then reported that, by a majority of those present, Mr. Alfred W. Bennett, Mr. Francis Darwin, Prof. E. R. Lankester, Sir John Lubbock, and Mr. Geo. J. Romanes, had been elected into the council in the room of E. R. Alston (deceased), Dr. Boycott, Prof. M. Foster, Dr. J. Gwyn Jeffreys, and Prof. St. G. Mivart, who retired; and for officers, Sir John Lubbock was elected President, Mr. F. Currey re-elected Treasurer, Mr. B. Daydon Jackson re-elected Botanical Secretary, and Mr. G. J. Romanes was elected Zoological Secretary.

June 16.—Sir John Lubbock, Bart., F.R.S., President, in the chair.—Mr. Alex. Somerville, Capt. J. T. Wright, and John Forrest, the Australian explorer, were elected Fellows of the Society.—The Secretary read a portion of a letter addressed to him by Mr. William Ferguson, of Colombo, in which he mentioned his having found *Wolffia arrhiza*, Wimm., in abundance in an abandoned stone quarry, covering the surface of the water; and that in a recent trip to the Kandyan country he had also discovered *Adiantum æthiopicum*, Linn., both these plants being new to Ceylon.—Mr. J. G. Baker exhibited and called the attention of the Fellows to a specimen of the inflorescence of the Socotran Aloe (*A. Perryi*), the source of the drug. Although the product of the plant had been known for two thousand years, yet this had been the first time it had flowered in this country; it might well, therefore, be alluded to as one of the oldest and yet newest of plants.—Surgeon-Major Aitchison then read a communication 'On the Flora of the Kuram Valley, Afghanistan,' Part II.; he showed by a map the peculiarities and nature of the valleys and mountain chains of the country generally, and hence the marked vegetation of the district.—Then followed a paper 'On Central African Plants, collected by Major Serpa Pinto,' by Prof. Count Ficalho and Mr. W. P. Hiern. The specimens were collected in August, 1878, along the upper course of the River Ninda, an affluent of the Zambesi, on the west side of the high plateau.

Botanical News.

Ernst Hampe, who died on the 23rd November, 1880, at Helmstedt, Hanover, was one of the most diligent workers among the *Muscineæ*. Among his independent writings may be named

'Das Moosbild' (Verhandl. Zool. Bot. Gesellsch., Vienna, 1871), containing his views on the classification of Mosses; his 'Flora Hercynica' (1873), including all the vascular plants and *Muscineæ* of the Harz region; and his 'Enumeratio Muscorum Lactenus in provinciis Brasiliensibus Rio de Janeiro et Sao Paulo detectorum' (1879). In addition to these labours, his assistance in the production of the 'Synopsis Muscorum Frondosorum' is acknowledged by Karl Müller to have been of the most valuable kind. He was born on the 5th of July, 1795, at Fürstenberg on the Weser, and at an early age began the study of pharmacy, in which he afterwards reached an eminent position. After residing in various towns of Germany in the practice of his profession, he settled down in 1825 at Blankenburg, in the Harz, where he continued to live until 1876. In that year he removed to the house of his second son, a physician in the neighbouring town of Helmstedt, where he died last November. The Harz was the field of most of his botanical explorations, and no one knew its flora better than he. A portrait of Hampe, and a long and interesting account of his life by his friend Karl Müller, appeared in 'Die Natur,' 22nd January, 1881. The interesting statement of Karl Müller, that when Hampe began the study of Mosses, the 931 species enumerated by Bridel (in 1827) were all the known species in the world, is worth reproducing. When the 'Synopsis Muscorum' was finished in 1851, the number had risen to 2303, and now Karl Müller estimates it at 6000, at least. Hampe was made a Doctor of Philosophy (*honoris causa*) by the Göttingen University on the occasion of his jubilee in his profession, and the title of Professor was bestowed on him in 1875. His splendid collections of Mosses and *Hepaticæ* are now in the Department of Botany of the British Museum.

The 'Flora of the Bristol Coal-fields' has been undertaken by the Bristol Naturalists' Society, and will be edited by Mr. J. W. White, hon. sec. of the Botanical Section. The limit adopted by the Society in this as in other like investigations carried out by its members is that defined by Sanders's Map of the Bristol Coal-fields. It includes a district extending north and south, from Berkeley and Dursley, in Gloucestershire, to Highbridge and Wells, in Somerset; and east and west, from Bath to the Bristol Channel. It is intended to publish the 'Flora' in five parts, each in succession to be issued with the Society's annual volume of 'Transactions.' The first part (*Dicotyledones*, Div. 1, *Thalamifloræ*) is now in the press. An historical sketch of Bristol Botany, with other introductory matter, is contemplated, but will not appear until the publication is complete. Although St. Vincent's Rocks are famed in botanical story, and the immediate vicinity of Bristol is rich in rarities almost beyond comparison, but little has hitherto been written concerning them, and the outlying portions of the district have met with still less attention. A contribution to our knowledge of so interesting a flora will therefore be welcome.

Original Articles.

A SYNOPSIS OF THE GENUS *PITCAIRNIA*.

By J. G. Baker, F.R.S.

Pitcairnia is one of the largest genera in *Bromeliaceæ*, and a considerable proportion of the species are in cultivation. Pitcairnias are plants that grow gregariously and present no special difficulty in drying, so that for the order it is exceptionally well-represented in herbaria. There is no recent synopsis of the genus, and not only have a considerable number of species now known never been named nor described, but for several of those founded on garden plants no definite localities or wrong ones have been given. I have therefore attempted to collect together in the present paper all the information on the subject to which I could get access in our English collections, living and dried, The last paper on the genus is one by Dr. Karl Koch, published as an appendix to the "Report of the Berlin Gardens for 1857," and reprinted in vol. vi. of Walpers' 'Annales.' When I was drawing up the catalogue of the species in cultivation at Kew, which was published in the 'Annual Report of the Garden for 1879,' Dr. Koch was so kind as to lend me all his type-specimens, which represented very fully the plants which had been brought into cultivation up to the date at which he wrote. To trace out the full synonymy of each species through the horticultural journals would only take up time and space needlessly; so I have confined myself, except in the case of figures, to the original authority for each name.

Genus Pitcairnia (*L'Herit. Sert. Angl.* vii., *t.* 11).—Calyx coriaceous, with a short obconical tube adnate to the base of the ovary and 3 large lanceolate segments free from one other down to where the ovary leaves the calyx. Corolla of 3 lingulate unguiculate petals 1½–3 times the length of the calyx-segments, inserted where the calyx leaves the ovary, usually with 2 minute scales at the very base, often subsecund when expanded, and twisting up spirally after fertilisation has taken place. Stamens 6, inserted with the petals at the summit of the calyx-tube; filaments long, filiform or rather flattened; anthers linear, basifixed. Ovary free except at the base, 3-celled; ovules in each cell very numerous, horizontal; style long, filiform; stigmas 3, linear, spirally twisted. Fruit a septicidal capsule, splitting into 3 valves from the apex down to the adnate calyx-tube. Seeds numerous, minute, flattened, generally conspicuously tailed at both ends. Herbs, rarely shrubs, generally acaulescent, with the leaves in a dense rosette on the ground at the base of the peduncle. Leaves linear or ensiform, rarely oblong, thin in texture for the order,

lepidote on the back or green and naked on both surfaces, often prickle-margined, especially towards the base, sessile or narrowed into a channelled petiole. Peduncle leafy, the proper leaves passing gradually upwards into the bracts. Inflorescence generally a simple or panicled raceme with lanceolate bracts, more rarely a capitulum or subspicate raceme, with large imbricated multifarious bracts. Corolla red, yellow, or whitish.

The following names, in my view, represent only synonyms or subgenera, viz. :—

Hepatis, Swartz Prodr. Fl. Ind. Occ. 56.
Neumannia, A. Brong. in Ann. Sc. Nat. ser. 2, xv. 369.
Lamproconus, Lemaire in Jard. Fleur. sub t. 127.
Phlomostachys, Beer Brom. 45.
Cochliopetalum, Beer Brom. 70.
Orthopetalum, Beer Brom. 70.
Pepinia, A. Brong.; André in Ill. Hort. n. s. sub t. 5.

Key to the Subgenera and Species.

Subgenus I. Cephalopitcairnia. Flowers red, arranged in a dense sessile head in the centre of the rosette of leaves.

Produced leaves linear, sessile . 1. *P. heterophylla.*
Produced leaves oblong, petioled . 2. *P. tabulæformis.*

Subgenus II. Eupitcairnia. Flowers generally bright red, rarely white or yellow, arranged in peduncled simple or panicled racemes. Bracts small, lanceolate, often shorter than the pedicels. Leaves in a basal sessile rosette.

Leaves linear, an inch or less broad at the middle.
Leaves white-furfuraceous beneath.
Produced leaves without any prickles.

Flowers white or yellowish.

3. *P. microcalyx.* 4. *P. inermis.*

Flowers red.

5. *P. megasepala.* 6. *P. staminea.* 7. *P. pungens.*
8. *P. Kegeliana.* 9. *P. pauciflora.* 10. *P. integrifolia.*
11. *P. araneosa.* 12. *P. Moritziana.*

Produced leaves prickle-margined towards the base.
Leaves very narrow (not more than $\frac{1}{4}$–$\frac{1}{3}$ in. broad).

13. *P. humilis.* 14. *P. muscosa.* 15. *P. caricifolia.*
16. *P. iridiflora.*

Leaves broader. Pedicels short.

17. *P. angustifolia.* 18. *P. latifolia.* 19. *P. furfuracea.*
20. *P. albucæfolia.* 21. *P. bracteata.* 22. *P. alta.*

Leaves broader. Pedicels long.

Flowers white . . 23. *P. consimilis.*

Flowers red.

24. *P. Jacksoni.* 25. *P. subpetiolata.* 26. *P. bromeliæfolia.*

Leaves green and glabrous on both sides.

Flowers red.

27. *P. firma.* 28. *P. corcovadensis.* 29. *P. cinnabarina.*
30. *P. Karwinskiana.* 31. *P. spathacea.* 32. *P. Lechleri.*
33. *P. concolor.* 34. *P. nuda.*

Flowers white.

35. *P. suaveolens.* 36. *P. albiflos.*

Leaves ensiform or lanceolate.

Leaves white-furfuraceous beneath.

Flowers red.

37. *P. Andreana.* 38. *P. pruinosa.* 39. *P. fulgens.*
40. *P. Olfersii.* 41. *P. flammea.* 42. *P. pulverulenta.*
43. *P. corallina.*

Flowers white . . . 44. *P. echinata.*
Flowers yellow . . 45. *P. xanthocalyx.*

Leaves green and naked on both surfaces.

46. *P. australis.* 47. *P. nubigena.* 48. *P. Lehmanni.*
49. *P. Kalbreyeri.* 50. *P. orgyalis.*

Leaves oblong or oblong-lanceolate petioled.

51. *P. Sprucei.* 52. *P. undulata.*

Imperfectly-known species of *Eupitcairnia*.

53. *P. vallisoletana.* 54. *P. penduliflora.*

Subgenus III. Pepinia. Caulescent, with small bracts and flowers in simple or panicled racemes.

Dwarf, with red flowers and thin leaves.

55. *P. punicea.* 56. *P. aphelandræflora.*

Shrubby, with white flowers and horny leaves.

57. *P. ferruginea.*

Subgenus IV. Phlomostachys. Flowers pale, arranged in simple subspicate racemes, the broad bracts reaching nearly or quite to the top of the calyx.

Leaves sessile . . 58. *P. virescens.*

Leaves petioled, green and naked on both surfaces.

59. *P. maidifolia.* 60. *P. Funkiana.* 61. *P. zeifolia.*

Leaves petioled, white beneath . 62. *P. recurvata.*

Subgenus V. NEUMANNIA. Flowers generally pale, arranged in dense simple strobiliform subspicate racemes, the oblong-deltoid acuminate much-imbricated bracts overtopping the calyx.

Leaves sessile	63. *P. ochroleuca.*
Leaves petioled, white beneath .	64. *P. rhodostachys.*

Leaves petioled, green and naked on both surfaces.
Flowers white or pale yellow.

65. *P. Altensteinii.* 66. *P. Wendlandi.* 67. *P. imbricata.*
68. *P. atrorubens.* 69. *P. petiolata.*

Flowers bright red-yellow .	70. *P. densiflora.*

1. P. HETEROPHYLLA, Beer Brom. 68.—*P. Morrenii*, Lemaire, Jard. Fleur, t. 291.—*P. cernua*, Kunth et Bouché Ind. Sem. Berol. 1848, 12!—*P. exscapa*, Liebm. Ind. Sem. Hafn. 1848, 12; Hook. in Bot. Mag. t. 4591.—*Puya heterophylla*, Lindl. in Bot. Reg. xxvi, t. 71.—*Puya longifolia*, Morren in Ann. Soc. Roy. Gand. ii. 483, t. 101; Paxt. Flor. Gard. iii. t. 86. Acaulescent, densely tufted. Outer rudimentary leaves of the rosette 10 or more, deltoid, scariose, with a rigid pectinate narrow linear almost pungent tip 1–3 in. long. Produced leaves about half a dozen, linear, 1–2 ft. long, $\frac{1}{4}$–$\frac{1}{2}$ in. broad at the middle, not petioled, tapering to a point, green on both sides, not at all toothed. Flowers 6–12 in a capitate sessile or nearly sessile spike; pedicels 0 or very short; bracts scariose, deltoid, $\frac{1}{2}$–$\frac{3}{4}$ in. long. Sepals reddish, lanceolate, 1–1$\frac{1}{4}$ in. long, nearly or quite glabrous. Petals bright red, rarely white, half as long again as the sepals, scaled at the base. Stamens and style included. — Mexico, *Sinclair! Bourgeau*, 2524! *F. Muller*, 1461! Guatemala, *Salvin & Godman!* Veraguas, *Seemann*, 1564! Nicaragua, *Ralph Tate*, 414, 415! Venezuela, *Fendler*, 1520! Santa Martha, *Purdie!* New Granada, *Goudot!* The names above cited seem to me all synonyms of one species, and that not a very variable one, well marked from every other (except *P. tabulæformis*) by its Nidularium-like inflorescence.

2. P. TABULÆFORMIS, Linden Cat. 1862, 5; E. Morren in Belg. Hort. 1862, 257, cum icone; Lemaire, Ill. Hort. t. 344; Floral Mag. t. 297. Produced leaves 20–30 in a sessile rosette, oblong, spathulate, 5–6 in. long, 2 in. broad at the middle, narrowed gradually to a base $\frac{1}{2}$ in. broad, chartaceous in texture, green on both sides, quite free from spines. Flowers 30–40 in a dense head sessile in the centre of the rosette of leaves; sepals lanceolate, naked, under an inch long, bright red. Petals bright red, three times as long as the sepals, scaled at the base. Genitalia included. Mexico, in the province of Chiapas, *Ghiesbreght*. Not unfrequent in cultivation.

3. P. MICROCALYX, Baker. — *P. caulescens*, K. Koch herb. Acaulescent. Produced leaves linear, almost petioled, 2 ft. long, $\frac{3}{4}$ in. broad at the middle, tapering to the point and base, thin in texture, green and slightly furfuraceous on the face, thinly white-furfuraceous all over the back, quite entire. Peduncle a foot long,

nearly naked, furnished with several much-reduced erect linear leaves, which are white on the under surface. Flowers in a dense simple raceme 4–5 in. long. Pedicels erecto-patent, the lower ones $\frac{1}{4}$–$\frac{1}{3}$ in. long; bracts lanceolate acuminate, equalling or rather exceeding the pedicels. Sepals lanceolate, $\frac{1}{3}$ in. long, thinly floccose, as are the pedicels and axis of the raceme. Petals yellowish, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long. Stigmas and anthers reaching to the tip of the petals. A cultivated plant; precise station unknown. I found it without any locality in the herbarium of Dr. Karl Koch. It is remarkable for its yellow flowers and very small calyx.

4. P. INERMIS, Meyer in Reliq. Hænk. ii. 123, t. 23.—*Orthopetalum inerme*, Beer Bromel. 72. Acaulescent. Produced leaves linear, a foot long, under $\frac{1}{2}$ in. broad, firm in texture for the genus, not petioled, acuminate, quite entire, green on the upper surface, white beneath. Peduncle $\frac{1}{2}$–1 ft. long, glabrous, its lower leaves long, its upper rudimentary. Panicle about a foot long, made up of a long end raceme and several short ascending branches; rachises naked; pedicels $\frac{1}{4}$–$\frac{1}{3}$ in. long; bracts linear-lanceolate, longer than the pedicels. Sepals lanceolate, reddish, glabrous, $\frac{1}{2}$–$\frac{5}{8}$ in. long. Petals white, more than twice as long as the sepals. Stamens and style shorter than the petals.—Peru, on mountains of the province of Hunaca, *Hænke*. Casapi, *Matthews*, 2088! Wet rocks, Carmillo, alt. 5000–6000 ft., *Pearce!*

5. P. MEGASEPALA, Baker. Acaulescent. Leaves with a distinct channelled petiole a foot long and a linear lamina 2–3 ft. long, about an inch broad at the middle, tapering gradually to the point and base, moderately firm in texture, green on the upper surface, white beneath, entirely destitute of teeth, except at the dilated base of the petiole. Peduncle 2–3 ft. long. Raceme simple or with a short fork a foot long, dense in the upper half; rachis very cottony; pedicels ascending, the lower $\frac{1}{2}$–$\frac{3}{4}$ in. long; bracts lanceolate, $\frac{3}{4}$–1 in. long. Sepals lanceolate acuminate, very cottony, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long. Petals bright red, lanceolate unguiculate, not more than half an inch longer than the sepals. Stamens and style included.—New Granada, at La Paila, *Holton*, 153! Ocana, alt. 5000 ft., *Kalbreyer*, 661! Remarkable for its very large calyx.

6. P. STAMINEA, Loddiges Bot. Cub. t. 773; Sims in Bot. Mag. t. 2411; Ill. Hort. new ser. t. 205.—*Orthopetalum stamineum*, Beer Brom. 70. Acaulescent. Outer rudimentary leaves not toothed. Produced leaves 10–20 to a tuft, linear, 1–2 ft. long, $\frac{1}{4}$–$\frac{1}{2}$ in. broad, very acuminate, firm in texture, green and naked on the face, thinly white-furfuraceous on the back, with a channelled petiole $\frac{1}{2}$ ft. or more long, entirely without teeth. Peduncle 1–2 ft. long, its lower leaves long, its upper rudimentary. Raceme simple, 1–$1\frac{1}{2}$ ft. long, lax, $\frac{1}{2}$ ft. broad when expanded, the rachis naked; pedicels patent, the lower above an inch long; bracts lanceolate, $\frac{1}{2}$–$\frac{3}{4}$ in. long. Sepals greenish, lanceolate, naked, $\frac{3}{4}$–$\frac{7}{8}$ in. long. Petals bright red, 2 in. long, very narrow, revolute at the apex, scaled at the base. Stamens and style both exserted.—Rio Janeiro, *Gardner*, 846! *Sello! Burchell*, 2934! Well known in cultivation; intro-

duced about 1820. In Ill. Hort., *loc. cit.*, it is said to have been found by Roezl in New Granada. Is not this a mistake?

7. P. PUNGENS, H. B. K. Nov. Gen. i. 294; Hook in Bot. Mag. t. 5356. Acaulescent. Tufts bulb-like at the base, the outer rudimentary leaves furnished with a long rigid pectinate tip, as in *P. heterophylla*. Produced leaves 6–8, linear, 1–1½ ft. long, ⅓–½ in. broad, acuminate, not petioled, naked on the face, loosely furfuraceous on the back, destitute of prickles. Peduncle ½–1 ft. long, cottony, its many leaves all small and bract-like, the lower sometimes pectinate. Raceme simple, dense, 4–8 in. long; rachis cottony; pedicels very short, the lower only ¼–⅓ in. long; bracts lanceolate, ½–1 in. long. Sepals lanceolate, rather cottony, ¾–⅞ in. Petals lingulate, bright red, 2 in. long, scarlet at the base, subsecund. Stamens and style reaching to the tip of the petals.—Andes of Ecuador and New Granada, ascending to 9000–10,000 ft., *Humboldt; Jameson*, 758! *Hall! Spruce*, 5878! 6012! Introduced into cultivation by I. Anderson Henry, Esq., of Edinburgh, from seeds sent by Prof. Jameson.

8. P. KEGELIANA, K. Koch herb. Lower leaves linear acuminate, entire, about a foot long, ¼–⅜ in. broad, green and naked on the upper surface, white beneath, overtopping the raceme. Peduncle slender, about ½ ft. long, with several long leaves. Raceme simple, moderately dense, about 3 in. long, with a flexuose cottony rachis; pedicels ascending, the lower ¼–⅓ in. long; bracts lanceolate acuminate, the lower ¾–1 in. long, the upper much smaller. Sepals lanceolate, ⅜–½ in. long. Petals bright red, twice as long as the sepals. Genitalia not exserted.—A native of Guiana, known to me only from a cultivated specimen in K. Koch's herbarium. Its affinity is with *P. caricifolia* and *P. muscosa*, but the leaves are destitute of teeth.

9. P. PAUCIFLORA, Baker. Acaulescent. Produced leaves 6–8 to a stem, linear, 12–18 in. long, ¼–⅓ in. broad at the middle, thin in texture, very acuminate, almost petioled, naked on the face, thinly white-furfuraceous on the back. Peduncle above a foot long, slender, with several long leaves. Raceme simple, very lax, ½ ft. long, with only 6–9 flowers and a slender cottony axis: pedicels ascending, the lower ¼–⅓ in. long; bracts lanceolate, a little longer than the pedicels. Calyx about an inch long, with a tube adnate to the ovary nearly as long as the lanceolate segments. Petals bright red, an inch longer than the sepals. Stamens and style reaching to the tip of the petals.—British Guiana, far in the interior, on high banks of the River Quitara, *Sir Richd. Schomburgk*, 585! This has the ovary more joined to the calyx than any other species I have seen.

10. P. INTEGRIFOLIA, Ker in Bot. Mag. t. 1462.—*P. decora*, A. Dietr. in Allg. Gartenzeit. xv. 352.—*P. graminifolia*, Hort. Acaulescent. Produced leaves linear, 2–3 ft. long, about ½ in. broad at the middle, tapering to a long point, not distinctly petioled, thin in texture, green and naked on the face, closely white-furfuraceous on the back, entirely destitute of teeth. Peduncle above a foot long below the inflorescence, with several

long leaves. Racemes 1–5, very lax, the end one a foot long, the axis cottony; pedicels ascending, $\frac{1}{4}$–$\frac{1}{2}$ in; bracts lanceolate, equalling or a little exceeding the pedicels. Sepals $\frac{1}{2}$–$\frac{5}{8}$ in. long, lanceolate, nearly naked. Petals an inch longer than the sepals, bright red, scaled at the base. Stamens and style not protruded.—St. Lucia, *Anderson!* New Granada, on rocks at Cumanacoa, *Funk*, 58! Well-known in cultivation. Introduced from the West Indies by Lady Amelia Hume about 1810.

Var. *major*, Regel, Ind. Sem. Petrop. 1869, 24, has leaves 3 ft. long and an inch broad, peduncle longer than the leaves, and a 2 ft. simple raceme.

11. P. ARANEOSA, Baker. Produced leaves linear, with a distinct channelled petiole above half a foot long and a linear lamina 2–3 ft. long, an inch broad at the middle, tapering gradually to both ends, green and naked on the back, white-furfuraceous all over the back, quite destitute of prickles. Peduncle 2 ft. or more long below the inflorescence, cottony, with many reduced leaves. Flowers in a rather dense end raceme a foot long and two shorter side ones; axis stout, densely cottony; pedicels erecto-patent, densely cottony, the lower $\frac{1}{4}$–$\frac{1}{3}$ in. long; bracts lanceolate, rahter longer than the pedicels. Sepals lanceolate acuminate, reddish, 12–13 lines long, pilose downwards. Petals bright red, half as long again as the sepals. Stamens and style not protruded beyond the petals.—New Granada, near Ocana, at 3500 ft., *Schlim*, 139!

12. P. MORITZIANA, K. Koch & Bouché Ind. Sem. Hort. Berol. 1856, App. 4. Produced leaves many to a rosette, linear, 1–1$\frac{1}{2}$ ft. long, an inch broad at the middle, not distinctly petioled, green and naked on the face, laxly irregularly furfuraceous beneath, mostly without prickles. Peduncles 6–15 in. long, with many erect reduced leaves. Raceme lax, simple, $\frac{1}{2}$–1 ft. long; axis thinly cottony; pedicels ascending, the lower $\frac{1}{2}$–$\frac{3}{4}$ in. long; bracts linear or lanceolate, $\frac{1}{2}$–1 in. long. Sepals naked, lanceolate, $\frac{3}{4}$ in. long. Petals lingulate, bright red or reddish yellow, 2–2$\frac{1}{2}$ in. long, not scaled at the base. Stamens as long as the petals. Style a little exserted.—A native of Guatemala, introduced more than twenty years ago and still in cultivation in the country. I saw it in flower at Messrs. Veitch's in 1874.

13. P. HUMILIS, Tenore in Ann. Sc. Nat. ser. 4, ii. 379,—Leaves linear, channelled, about a foot long, 4–5 lines broad, furnished with small white teeth with a black tip. Raceme lax, few-flowered; pedicels about an inch long; bracts very small. Sepals red-tinted, about an inch long. Petals red, nearly three times as long as the sepals, scaled at the base.—A garden plant, known to me only from the published description.

14. P. MUSCOSA, Mart. in Roem. et Schultes Syst. Veg. vii. 1240; Hook. in Bot. Mag. t. 4770.—*P. Beycalema*, Beer Brom. 63.—*P. leiolema*, Hort. Van Houtte. Whole plant not more than a foot high. Leaves 12–20 in a tuft, linear, 6–9 in. long, $\frac{1}{4}$–$\frac{1}{3}$ in. broad, falcate, very acuminate, green and naked on the face, white-furfuraceous on the back, not petioled, entire or minutely denticulate. Peduncle 6–9 in. long, slender, densely floccose, its lower leaves

long, its upper rudimentary. Raceme simple, lax, 3–6 in. long; axis floccose; pedicels ascending, the lower 6–9 lin. long; bracts lanceolate, rather shorter than the pedicels. Sepals linear, naked, ¾ in. long. Petals bright red, 2 in. long, not scaled at the base. Stamens and stigma not protruded beyond the petals.—Central Brazil, first gathered by Martius on the Sierra de Piedade. Well-known in cultivation.

15. P. CARICIFOLIA, Mart. in Roem. et Schultes Syst. Veg. vii. 1242. Leaves linear, 12–18 in. long, ¼–⅓ in. broad, naked on the face, furfuraceous on the back, minutely denticulate towards the tip and furnished with brown spines towards the base. Peduncle under a foot long, leafy, floccose. Raceme simple, lax, 4–5 in. long; axis floccose; pedicels ascending, ¼ in. long; lower bracts lanceolate, twice as long as the pedicels. Sepals lanceolate acuminate, ⅝ in long. Petals red, 1½ in. long, scaled at the base. Stamens and style reaching to the tip of the petals.—Woods of the Amazon Valley, *Martius*.

16. P. IRIDIFLORA, Beer Brom. 51. Leaves linear, 2–3 ft. long, ⅓ in. broad, much overtopping the raceme, spine-toothed. Peduncle and raceme each about half a foot long; bracts above an inch long; raceme dense. Ovary including the sepals 1½ in. long. Petals bright red, 2 in. long, not scaled at the base. Style and stamens as long as the sepals.—A garden species, known to me only from the published descriptions.

17. P. ANGUSTIFOLIA, Soland. in Ait. Hort. Kew. i. 401; Gawl. in Bot. Mag. t. 1547; Red. Lil. t. 76.—*P. Redouteana*, Schultes Syst. vii. 1243. Leaves linear, about 2 ft. long, ¼–½ in. broad, acuminate, not petioled, green on the face, white-furfuraceous over the back, armed down the margins with curved ascending brown horny spines a line long. Peduncle 2–3 ft. long, including the inflorescence, with long leaves in the lower part. Racemes 1–3, the end one 6–9 in. long, 3 in. diam. when expanded; axis slightly floccose; pedicels erecto-patent, ⅛–⅙ in. long; bracts lanceolate, a little longer than the pedicels. Sepals lanceolate, ½–⅝ in. long. Petals 18–21 lin. long, bright red, scaled at the base. Stamens and style not exserted.—Island of Santa Cruz, West Indies, *Ryan!* (Herb. Mus. Brit.) My description is taken entirely from this wild example and a garden specimen in the Smithian herbarium. K. Koch's type-specimen was a different species, and I have never seen the true plant in cultivation, although the name is frequently used.

18. P. LATIFOLIA, Soland. in Ait. Hort. Kew. i. 401; Bot. Mag. t. 856; Andrews Bot. Rep. t. 322. Leaves linear, 2–3 ft. long, ¾–1 in. broad at the middle, acuminate, not distinctly petioled, green on the face, white-furfuraceous over the back, with only a few prickles towards the base and sometimes also a few towards the tip. Peduncle 1–2 ft. long, leafy. Raceme simple or slightly compound, 6–9 in. long; axis slightly cottony; lower pedicels ¼–⅜ in. long; bracts lanceolate, about as long as the pedicels. Sepals lanceolate, nearly naked, ¾–1 in. long. Petals bright red, 2 in. long, scaled at the base. Stamens and style not protruded.—

Island of St. Eustace, *Masson!* There is a specimen from Kew Gardens in 1786 at the British Museum, and one from the Liverpool Botanic Garden in 1805 in the Smithian Herbarium. C. Wright's 689, from Eastern Cuba, differs from the type by shorter sepals, narrower leaves, and much smaller bracts.

(To be continued.)

ON SOME RARE PLANTS IN COUNTY DONEGAL.

By Henry Chichester Hart, B.A.

During the summer of the past year and spring of the present one (1881) I was enabled to make further botanical explorations in this county. The results of these I now offer to your readers in continuation of my former papers upon this subject published in this Journal.

The following plants are additions to the Flora of Donegal, *i. e.*, District 11 in Moore and More's 'Cybele Hibernica":—

Ranunculus peltatus, Fries.
R. heterophyllus, Bab.
**Prunus insititia*, Linn.
Pyrus Aria, Sm.
**Dipsacus sylvestris*, Linn.
Hieracium umbellatum, Linn.
Bartsia viscosa, Linn.
Stachys Betonica, Benth.
Primula veris, Linn.
Rumex Hydrolapathum, Huds.
**Polygonum Bistorta*, Linn.
‡*Ulmus montana*, With.
Potamogeton heterophyllus, Schreb.
Carex teretiuscula, Good.

In the following list those plants the localities of which do not enter into my formerly defined district of North-Western Donegal, I have marked with the capital letter "D"; "F," as before, signifies Fanet.

Thalictrum alpinum, L. At an altitude of 1900 feet, about one mile west of Lough Belshade; on Lavagh More on both south and north sides; and on Silver Hill. These localities lie on the Bluestack or Croagh Gorm range in the south-west of Donegal. I have previously recorded this rare alpine plant from the Poisoned Glen. D.

Ranunculus peltatus, Fries. Marshy ground between Inch Road station and Burnfoot.

R. heterophyllus, Bab. Near the last, by the railway.

R. sceleratus, L. Salt-marshes at Templecroney, west of Dunglow; marshy ground between the two embankments at Inch Road.

Trollius europæus, L. There are two distinct sets of habitats given for this most interesting Donegal plant in the 'Cybele Hibernica'; one, "Convoy and Lough Garten," and the other, "near Raphoe." These are wrongly grouped and misleading, they should be "Lough Garten" and "Convoy and Raphoe"; the latter two places are but a couple of miles apart, while they are both fifteen or twenty miles from Lough Garten. In the

'Journal of Botany' for 1880 (p. 272) I have defined its Lough Garten range; since then, Dean Gwynn has informed me that the inhabitants of Convoy think the plant may possibly have been introduced there from Lough Garten, and thence to Raphoe, which is by no means a natural place for it. The Lough Garten station, therefore, with its derivatives, remains the only indisputably indigenous one in Ireland for this rare and handsome plant.

**Chelidonium majus*, L. "Breaghy" and "The Lodge," near Ramelton, where it is known as "Sollendine," and in great request for sore eyes (Dean Gwynn).

**Cheiranthus Cheiri*, L. Rathmullan Abbey.

‡*Barbarea vulgaris*, R. Br. Very rare in Donegal. I have only met with it at Marble Hill in small quantities, where it was probably introduced by accident.

Draba verna, L. Sandhills in various places from Buncrana to Hornhead; in most such localities, as at Macamish, Dimnacraig, Bottom Shore, Carrigart, Marble Hill, Dunfanaghy, and Hornhead, I noticed this plant in company with *Saxifraga tridactylites*, *Cerastium semidecandrum*, *C. tetrandrum*, and *Valerianella olitoria;* May, 1881.

†*Reseda Luteola*, L. At Fahan and Inch Road; between Fahan and Buncrana by the railway.

Elatine hexandra, DC. Very rare; western shore of Upper Lough Nacung, near the "Cung."

Drosera intermedia, Hayne. About a mile S.E. of Crohy Head, in the Rosses. D.

Silene maritima, With. At 1500 feet above sea-level on Lavagh More in the Bluestack range. D.

Stellaria graminea, L. Local; by the river Lennan at Ballyarr; sea-shore about three miles west of Dunglow.

Cerastium tetrandrum, Curt. Sandhills round the coast from Rathmullan to Hornhead; see under *Draba verna*.

C. semidecandrum, L. With the last, but not so common; Buncrana. F.

Radiola Millegrana, Sm. Near Dunglow.

Geranium dissectum, L. Fahan, by the railway.

†*Prunus Cerasus*, L. Hedges in Ballymacgowan, Fanet. F.

‡*P. avium*, L. Glenalla wood, but probably introduced.

**P. insititia*, L. Ned's Point, near Buncrana; hedges in Ballymacgowan, Fanet. F.

Agrimonia Eupatoria, L. Local; Lettermacaward, near "Russell's Ferry." D.

Comarum palustre, L. A variety occurs by the shore, about three miles west of Dunglow, with very narrow leaflets, invariably seven in number; it was not in flower when observed.

Pyrus Aria, Sm. Amongst mountain thickets at Glenveagh; an addition to the Flora of Donegal.

Peplis Portula, L. Not common; Aughnagaddy.

Myriophyllum spicatum, L. Rare; in a pool by the road-side near "Russell's Ferry," in Lettermacaward. D.

**Epilobium angustifolium*, L. Near Ballyconnell bridge, Glenalla. The country people know it as the "Blooming Willow."

Saxifraga tridactylites, L. Sandhills round the coast from Rathmullan to Hornhead; May, 1881. F.

**Apium graveolens*, L. Established by the road-side near the town of Donegal. D.

Pimpinella Saxifraga, L. Extremely local in Donegal. Sandy ground by the sea about three miles west of Dunglow.

Oenanthe crocata, L. Local; sea-side near Dunglow; by the shore between Fahan and Inch; and by the river Lennan at Ballyarr, the only inland locality I have noted.

Myrrhis odorata, Scop. Near the town of Donegal. D. Near Ramelton.

Smyrnium Olusatrum, L. Between Fahan and Inch; Rathmullan Point.

Viburnum Opulus, L. Very local; by the river Lennan at Ballyarr.

**Dipsacus sylvestris*, L. Road-side near Lifford (Dean Gwynn). An addition to the Flora of the county.

Valerianella olitoria, Mœnch. This plant is very plentiful on dry sandy pastures by the sea, and sandhills in most places round the coast from Rathmullan to Hornhead. It is always very minute in such situations, averaging about half an inch in height, with a tiny head of pale blue flowers. I have only seen one or two plants as large as the usual corn-field form near Ray by the sea-side. I mention these particulars since Mr. Watson challenges it as a native of the British Isles; as it grows in Donegal it has every appearance of being native; see under *Draba verna*. F.

Eupatorium cannabinum, L. Very rare in Donegal; thickets between Sesiagh Lake and Dunfanaghy.

†*Petasites vulgaris*, Desf. Abundant on the south-west side of Inch Island; railway-banks between Fahan and Inch.

Bidens cernua, L. Road-side between Stranorlar and "The Gap." D.

**Inula Helenium*, L. Near the road-side between Ardnamona and Donegal. D.

Hieracium umbellatum, L. (var. *filifolium*). This plant grows abundantly by the stream at Glenties. An addition to the Flora of Donegal. D.

H. anglicum, Fries. Lavagh More; near Lough Belshade; between Glenties and Silver Hill. D.

Tanacetum vulgare, L. Near the Fahan railway-station (Dean Gwynn).

Gnaphalium sylvaticum, L. Between Glenties and "Russell's Ferry," near the latter. D.

Senecio Jacobæa, L., var. *flosculosus*, Jordan. North-western shore of Trawenagh Bay; abundant, and unmixed with the rayed form. D.

Arctostaphyllus Uva-ursi, Spr. Abundant to sea-level at Crohy Head. D. Glenveagh.

Vaccinium Vitis-idæa, L. Glenveagh; Knockalla, by the larger

of the two "Black Lakes." F. Croagh Barnes, Blue Stack, Lavagh More, and Silver Hill. D.

Pyrola media, Sm. Marble Hill.

**Ligustrum vulgare*, L. Well established along the railway between Fahan and Inch.

Convolvolus arvensis, L. An undoubted native on sandy banks at Leenane, Lough Swilly; Inch Road.

Myosotis palustris, With. By the river Lennan at Ballyarr. I have not seen the large Forget-me-not elsewhere in Donegal, where it appears to be very scarce.

M. versicolor, L. Not common in Donegal; Clonmass Island, Ards; fields by Lough Fern upon Moyle Hill; near Glinsk. F.

**Symphytum officinale*, L. Between Fort Royal and Macamish, Lough Swilly.

Mertensia maritima, Don. I have previously recorded this rare northern plant from between Leenane and Dunaff Head, near Leenane, upon the authority of Mr. Batt. It does not now appear to grow in the locality indicated; it occurs, however, in Sheephaven.

Bartsia viscosa, L. This most interesting addition to the Flora of Donegal is chiefly due to my friend Dean Gwynn. While travelling from Derry to Fahan, he noticed from the railway-carriage an unusual-looking, tall, yellow-flowered plant on the Lough Swilly side of the line from Inch Station to Burnfoot. Shortly afterwards I went in search, and found a profuse growth of the present species in the site indicated. Several visits subsequently enabled me to trace its distribution. It is abundant chiefly on ground that has been reclaimed from the sea, stretching for about a mile between Inch Island and the east shore of Lough Swilly; it grows freely also on the shore of Inch, which was probably its original head-quarters, whence it has extended over so suitable a locality. This habitat forms an intermediate station for the plant which occurs on the Scottish coast at Dumbarton; on the south and south-western coasts of Ireland; and at Cornwall, Isle of Wight, and Sussex.

Lycopus europæus, L. Near Magherawarden. F.

Stachys Betonica, Benth. I found this very rare Irish plant in August, 1881, growing in small quantities amongst thickets by the shores of Dunlewry Lough, below Dunlewry House. An addition to the Flora of Donegal.

Utricularia intermedia, Hayne. Abundant in the river between Gweedore and Loch Nacung Lower.

U. minor, L. Upon Croaghmore, near the gap Barnesmore.

Primula veris, L. In two fields at Marble Hill, by the shores of Sheephaven Bay, where it was pointed out to me by my friend the Rev. Alexander Stuart, who has always regarded it as native there. The only locality in the county.

Salicornia herbacea, L. Shores of Trawenagh Bay. D.

**Polygonum Bistorta*, L. Castlewray, Letterkenny (Dean Gwynn). The plant has been known there as long as can be remembered.

P. Raii, Bab. Shores of Maghery Bay, west of Dunglow.

Rumex Hydrolapathum, Huds. Deep pools by the railway near Fahan station. An addition to the Flora of Donegal.

Salix herbacea, L. Occurs as low as 1100 feet above sea-level between the lakes and the summit of Erris mountains, in Innishowen. Mr. Watson gives 1600 feet in the Orkneys as the lowest in Britain. It has been observed at 1200 feet also in Derry. A very large form of this plant grows on the south side of Lavagh More, in the Bluestack range, with erect branches about eight inches high.

**Ulmus montana*, With. In many woods and plantations, as at Ray, Glenalla, &c., where it is thoroughly established.

Neottia Nidus-avis, Rich. Recorded in 'Recent Additions to the Flora of Ireland,' from Ards woods, by Mr. M. Murphy, where I have gathered it under beeches by the avenue near a garden-wall.

Orchis pyramidalis, L. Fort Royal, Rathmullan.

Listera cordata, R. Br. Erris, near Dunree (G. V. Hart).

Habenaria viridis, R. Br. By the shore near Templecrone, about three miles west of Dunglow.

Allium Babingtonii, Borr. This garlick is still made use of by cow-doctors; a decoction made from the root is said to be good for sick cattle; and if the tail of a calf be split and a bulb of the head be lashed inside, the animal will never die of a prevalent disorder named "black-leg."

A. ursinum, L. Ray woods, on both sides of the Rathmullan road; and at Ned's Point, near Buncrana.

Eriocaulon septangulare, With. Abundant in Lough Aleckmore, a little north of Travenagh Bay. D.

Sparganium natans, L. (*S. affine*, Schn.) Toome Lough, at Lettermacaward, with *S. minimum*, Fries.

Potamogeton heterophyllus, Schreb. Lough Nacung Lower, and stream from it to Gweedore. This is the second Donegal locality for this plant which I omitted to enumerate amongst the additions to the county in my last paper on the subject.

Zannichellia palustris, L. Brackish mud at Inch and Doagh.

Scirpus Tabernæmontani, Gm. Salt-marshes about three miles west of Dunglow.

Eleocharis multicaulis, Sm. Not so local as supposed; frequent about Dunfanaghy, and near Marble Hill, &c.

Blysmus rufus, Panz. Salt-marshes by Hornhead bridge, abundant.

Carex vulpina, L. Scarce; marshy ground between Inch Road and Burnfoot.

C. teretiuscula, Good. Very rare; by a small lake between Marble Hill and Sesiagh Lough, near Dunfaughy.

C. paniculata, L. Very local; with the last-named sedge.

C. oralis, Good. Local; by the shore about half a mile west of Dunglow.

C. stricta, Good. Rare; with *C. teretiuscula*, mentioned above.

C. limosa, L. This rare sedge is recorded from "Gap of Urris," in Donegal, by C. Moore; if by this he meant Mamore Gap, in the Erris mountains, east side of Lough Swilly, I fear this locality no longer holds good. There is a small marshy pond there which is

almost entirely occupied by *Carex ampullacea*, which has a marvellous power of filling up small lakes. *C. limosa*, however, occurs elsewhere in Donegal.

Melica uniflora, Retz. Woods between Ray and Rathmullan.

Festuca sylvatica, Vill. By the river at Glenties, D.; with the last; and at "Ned's Point," near Buncrana.

Equisetum maximum, Lam. Abundant near the town of Donegal. D.

E. palustre, L. Damp sandy places by Ballyvicstocker Strand. F.

Polypodium Phegopteris, L. In many places about Lough Eske and Lough Belshade; and on Blue Stack, Lavagh More, and Silver Hill, in the south-west of Donegal. D.

Lastrea Oreopteris, Presl. Between Lough Belshade and Lough Eske, by the stream; and at the waterfall above Lough Eske; between Glenties and Silver Hill. D. Kockalla (G. V. H.) F.

Polystichum aculeatum, Roth. Waterfall above Lough Eske; between Martin's Bridge and Silver Hill, by a stream. D.

Cystopteris fragilis, Bernh. Very local in Donegal. In a natural grotto on the face of Binmore precipice, half a mile west of Lough Belshade, a place rather difficult of access. Two plants above a small cataract between Martin's Bridge and Silver Hill. D.

Asplenium viride, Huds. Old walls at Convoy, near Raphoe, where it appeared a few years ago; by the waterfall above Lough Eske; I did not meet it elsewhere on the Lough Eske mountain. D.

Asplenium Ruta-muraria, L. Road-side walls by Lough Eske, at Ardnamona. D. Rare in the north of the county; on an old garden-wall in Ramelton.

Hymenophyllum Wilsoni, Hook. Gap of Mamore, and elsewhere on the Erris mountains.

Botrychium Lunaria, L. Sheep-pastures on the west side of Rossgull.

The present seems to be a good opportunity for enumerating the plants which have been added to, and those which have to be removed from, the Flora of the County Donegal, as it stood in 1866, the date of the publication of Moore and More's 'Cybele Hibernica.'

The following are additions :—

Thalictrum alpinum.
[T. minus.]
Ranunculus trichophyllus.
R. Baudotii.
R. peltatus.
R. heterophyllus.
[Papaver Rhœas.]
*Corydalis lutea.
*Cheiranthus Cheiri.
Lepidium Smithii.
Drosera intermedia.
Polygala depressa.
‡Silene inflata.
†Lychnis vespertina.
Sagina apetala.
S. subulata.
Stellaria graminea.
Cerastium glomeratum.
C. triviale.
‡Althæa officinalis.
*Lavatera arborea.
‡Acer campestris.

*A. Pseudo-platanus.
*Geranium pyrenaicum.
*Erodium moschatum.
Ulex Gallii.
Trifolium filiforme.
Vicia angustifolia.
V. lathyroides.
‡Prunus Cerasus.
Agrimonia Eupatoria.
Rubus suberectus.
R. plicatus.
R. discolor.
R. carpinifolius.
Rosa arvensis.
*Prunus insititia.
‡Pyrus Malus.
P. Aria.
[P. communis.]
*Ribes Grossularia.
Myriophyllum spicatum.
Scleranthus annuus.
Saxifraga hypnoides.
S. hirta.
S. aizoides.
[S. Cymbalaria.]
[S. sarmentosa.]
†Apium graveolens.
[Carum Carui.]
‡Aethusa Cynapium.
*Pastinaca sativa.
*Petroselinum sativum.
‡Valerianella dentata.
*Dipsacus sylvestris.
†Knautia arvensis.
*Petasites fragrans.
*Inula Helenium.
Anthemis nobilis.
Gnaphalium sylvaticum.
[Antennaria margaritacea.]
Saussurea alpina.
[Cichorium Intybus.]
Sonchus asper.
Hieracium umbellatum.
H. boreale.
†Lycopsis arvensis.
Lithospermum officinale.
‡Verbascum Thapsus.
Scrophularia aquatica.
*Linaria vulgaris.
L. repens.
*L. Cymbalaria.
Pedicularis sylvatica.
Bartsia viscosa.
[Veronica peregrina.]
[V. Buxbaumii.]
Mentha sativa.
M. arvensis.
Scutellaria galericulata.
†Lamium amplexicaule.
†L. intermedium.
†L. incisum.
Stachys Betonica.
†S. arvensis.
†Ballota nigra.
*Nepeta Cataria.
Primula veris.
[Plantago media.]
Atriplex angustifolia.
A. Babingtonii.
Oxyria reniformis.
*Polygonum Bistorta.
P. viviparum.
Rumex Hydrolapathum.
Euphorbia amygdaloides.
‡E. exigua.
Callitriche hamulata.
‡Ulmus montana.
†Salix Smithiana.
S. Grahami.
Orchis pyramidalis.
Epipactis latifolia.
Neottia Nidus-avis.
*Iris fœtidissima.
*Allium Babingtonii.
A. ursinum.
Luzula pilosa.
Potamogeton heterophyllus.
P. crispus.
P. pusillus.
P. filiformis.
Zostera nana ?
Zannichellia palustris.
Carex teretiuscula.
Festuca sylvatica.
Equisetum hyemale.
Adiantum Capillus-Veneris.
Ophioglossum vulgatum.
O. lusitanicum.

The following plants I propose to remove from the Donegal list:—

Viola lutea, Huds. "Sandhills at Dunfanaghy, County Donegal (Mr. Thompson)." Flora of Ulster. The only sandhill pansy I can observe there is *V. Curtisii*, Forst.

Calamintha officinalis, Mœnch. I am informed by my friend, A. G. More, that the locality given for this plant in the 'Cybele Hibernica' belongs really to *C. Clinopodium*, and is the same station as that given subsequently for the latter plant.

Euphorbia hyberna, L. My reasons for excluding this plant will be found under *E. hyberna* and *E. amygdaloides*, in a a paper on the Flora of North-Western Donegal, 'Journal of Botany,' 1879 (p. 144). Further search since that date has confirmed my opinion that this spurge does not occur in the Poisoned Glen.

Polystichum Lonchitis, Roth. In Newman's 'British Ferns,' the Holly Fern is credited with the locality of "Rosses and Fanet"; but I was informed by Dr. Moore that this was a mistake. The other station in Donegal is "a glen east of Lough Eske" (Prof. E. Murphy), an unlikely station, the glens on the east being of too low level for Alpine plants. In one, however, the "Waterfall Glen," to the north of east from the lake, I have gathered with *Asplenium viride* a very lonchitioid form of *Polystichum aculeatum*. Since then I have learned from a lady, who, with her brother, has lived there and botanized for many years, that she never could succeed in finding this fern, although, in consequence of the above record, they had been constantly in search of it. She states that "the fern that is always taken for the Holly Fern is the *Aspidium lobatum*."

NOTES ON POTAMOGETONS.*

By Arthur Bennett, F.L.S.

Potamogeton sparganifolius, Læst.—The branching or non-branching of the stems of this species seems one of degree rather than fact. The specimen from Læstadius in the Kew Herbarium has branches three to four inches long, given off about half-way up the stem, yet it is not branched from below.

P. Lonchites, Tuckerman.—I possess a fine series of this from the Rev. T. Morong, U.S.A.; and there is no doubt Dr. Boswell is correct in referring the Irish specimens to it.

P. salicifolius, Wolf.—Specimens of Wolfgang's plant (from the author) in Herb. Brit. Museum are not the same as the North American *P. Lonchites:* and the Rev. T. Morong writes me that the Scandinavian *salicifolius* is "certainly not our *Lonchites*." The plant gathered by the Rev. A. Ley, and referred to *salicifolius* by Professor Babington, is also not accepted by Morong as *Lonchites:* it is probably the *P. salicifolius* var. *lanceolatus* of Scandinavian authors.

---

* See 'Journal of Botany,' 1872, p. 228.

P. gramineus, L., var. *maximus*, Morong (*heterophyllus*, Schreb., var.),—Specimens I gathered last year in Burwell Fen, Cambridgeshire, I was unable to refer to any British form of the "*gramineus*" of Linn. (*heterophyllus*), and the only specimen I could find resembling them was one in the Kew Herbarium, labelled "Canada West, Prof. Macoun." The receipt of specimens of Morong's plant enabled me to at once identify them with it, and I am glad to say he concurs with me. He remarks:—"It seems just the same as our *gramineus* var. *maximus*. Our plant grows in rivers, generally in strong currents. It varies from the typical forms of *gramineus*, being less branched, and entirely without the dichotomous ramification of the branches so common in the grass-leaved form. The leaves are far fewer and scattered along the stem. Some of the submerged leaves are nearly an inch wide by seven long. Were it not that the so-called var. *graminifolius* is intermediate, I should be disposed to separate the large form from *gramineus* altogether. Your plant being from 'a ditch' shows that it is not the current alone which causes the difference, as its locality with us would seem to indicate."

P. prælongus, Wulfen.—The following interesting remarks I have from the Rev. T. Morong:—"This species has with us a curious habit. It fruits and flowers very late in the autumn (Nov. to Dec.), and the spikes hang on all winter under the ice. My specimens in spike are, as you see, collected in July, and all that have been sent me were old spikes of the previous fall, collected in summer. Has any European botanist noticed the same thing?"

P. perfoliatus, L., var. *lanceolatus*, A. Gray.—Specimens agreeing with the United States plant I have from Scotland (Mr. A. Brotherston). The leaves are two and a half to three and a half inches long, cordate-clasping, and gradually tapered to the end. A very peculiar form of *perfoliatus* from Italy (Prof. Caruel) has the leaves stiff, strongly undulated at the edge, and of a very dense texture. Another from Hungary (Herb. Dr. Kováts) has very stout stems and spikes, with the fruit with remarkably long pedicels, and the whole plant of a peculiar greasy appearance. A slender form with long peduncles occurs in Looe Pool, Helston, Cornwall (Mr. E. Straker), agreeing with specimens from Mass., U.S.A. (Rev. T. Morong).

P. crispus, L.—Specimens with the "winter-buds," gemmæ, or hybernacula, occurred plentifully on Mitcham Common, Surrey, this spring. I do not think they are mentioned in any of our floras. They are figured in 'The Phytologist,' n. s., vol. ii., p. 69, 1862; see also Trans. Bot. Soc. France (1856), vol. iii., p. 350. They occur in North America, accompanied by others at the end of the shoots.

P. acutifolius, Link.—A form of this occurs (rarely) in ditches (Norfolk), differing from the usual British plant in being of much stronger growth, with longer internodes, the leaves of a firmer texture, the peduncles longer ($\frac{3}{4}$ in.), the fruit larger, and crenulated on the back when dry. It is perhaps the var. of **a.** *major* (Fieber, Die Pot. Böh. 1838, p. 35).

P. mucronatus, Schrad.—We probably have in England a *Potamogeton* that is not *pusillus vulgaris*, Fr., or *mucronatus*, Schrad.: the immature fruit differs from those forms as pointed out to me by the Rev. T. Morong, who writes me that he has a similar plant from Sweden (Prof. T. Fries) unnamed; but ripe fruit is a desideratum for certain determination.

P. pusillus, L., var. (*P. panormitanus*, Bivoni).—Mr. H. Mennell has gathered this near Clapham, in Yorkshire, making a second British station.

FESTUCA ORARIA, Dumortier.

By F. Townsend, M.A., F.L.S.

In the 1881 Report of the Botanical Exchange Club Dr. Boswell is said to have sent specimens of *Festuca arenaria*, God., *glabrescens*, *F. oraria*, Dumort., from Burntisland, Fife, which Prof. Babington would call "*rubra*." This reminds me that Mr. H. C. Watson planted in his garden, if I recollect rightly, in a pot, specimens sent to him as *F. oraria*, when they did not remain true, but became "*rubra*"; but I cannot resist the impression that the specimens Mr. Watson planted may not have been true *F. oraria* of Dumortier.

A few months back I saw, in Dr. Bromfield's herbarium at Ryde, specimens named by Mr. A. G. More *F. oraria*, Dumort., from St. Helen's Spit, Isle of Wight, and Mr. More gives this species as an additional one for the Isle of Wight in his Suppl. to 'Fl. Vectensis' in 'Journal of Botany,' 1871. I should call Mr. More's specimens decidedly "*rubra*," and I have gathered a similar plant myself on St. Helen's Spit. I have no other record of true *F. oraria* as a Hampshire plant.

In the Royal Herbarium at Edinburgh there are excellent and typical specimens of *Festuca oraria* from the sands of Barrie, gathered by Mr. J. Knapp in July, 1837, and, together with other remarks of his, accompanying the specimens, he writes, "retains its character in cultivation." The late Mr. F. M. Webb informed me that Mr. Knapp was an Edinburgh physician, who made the Grasses his especial study, and watched them under cultivation. We have therefore conflicting statements as to the behaviour of this grass under cultivation, and this circumstance, combined with the two above instances of the same plant being named by one botanist *F. oraria*, and by another *F. rubra*, would induce us to form an opinion that Mr. Watson's experiment is not a conclusive proof that *F. oraria* is not distinct from *F. rubra*.

A botanist who has seen *F. oraria* growing spontaneously, and has noticed its long and stout soboles and other marked characters, would find it difficult to believe that it could pass into *F. rubra*.

A NEW CHINESE *RHODODENDRON*.

By H. F. Hance, Ph.D., F.L.S.

Rhododendron (*Eurhododendron*) subseries 3) Henryi, sp. nov. —8–12 pedale, ramulis cinereis novellis petiolisque pilis rigidis capitatis consitis, foliis coriaceis elliptico-lanceolatis basi subacutis apice breviter acuminatis novellis supra subtusque ad costam setosis margineque dense setoso-ciliatis maturis undique glaberrimis supra lucidulis subtus pallidioribus haud lepidotis laxe reticulatis venis omnibus æqualibus marginem versus arctius anastomosantibus utrinque modice elevatis 2½–5 poll. longis incluso petiolo 3–7 lineali capitato-setoso 9–16 lin. latis, gemmarum floriferarum sicut foliigenarum squamis pluriseriatis ovatis exterioribus sensim minoribus dense breviter albociliatis, innovationibus dense glanduloso-pilosis inferne squamis oblongis distantibus 6–8 linealibus præditis, floribus quinis terminali-subumbellatis lilacinis vel amoene roseis suaveolentibus, pedicellis glanduloso-pilosis subpollicaribus, calycis 5-partiti phyllis inæquilongis linearibus acutissimis dense glanduloso-setaceo-pectinatis 3–6 linealibus, corollæ infundibulari-campanulatæ passim glaberrimæ bipollicaris tubo sursum ampliato semipollicari lobis oblongis acutiusculis, staminum 10 dimidiam corollam adæquantium filamentis basi glanduloso-pubentibus superne glaberrimis antheris obovoideis apice poris binis ovalibus dehiscentibus, ovario oblongo dense fulvo-setoso 5-6-loculari, stylo glaberrimo breviter exserto, stigmate conspicue capitato indiviso.

Speciosam hanc arbusculam latera collium supra cœnobium buddhicum Fi-loi-tsz, ad angustias Tsing-ün fluvii North River, provinciæ Cantonensis, venustissimis floribus abundanter exornantem, d. 22 Martii 1881, invenit Rev. B. C. Henry, cui lubens sacravi. (Herb. propr. no. 21638.)

Through the liberality of M. Maximowicz, I possess authentic specimens of nearly all the species enumerated in his 'Rhododendreæ Asiæ orientalis'; but the present extremely handsome plant does not, in my judgment, come very near to any of those known to me. I believe I have correctly indicated its position in this difficult genus, in the subseries containing *R. Dalhousiæ*, Hook. fil., *R. ciliatum*, Hook. f., *R. Nuttallii*, Booth, &c., and which is nearly equivalent to Nuttall's section *Cleiodendron*;* and perhaps its closest affinity is rather with the Himalayan *R. barbatum*, Wall., than with any Chinese species yet described.

* Hook. Journ. Bot. v. 354 (1853).

NOTES ON THE FLORA OF DERBYSHIRE.

By the Rev. W. H. Painter.

(Continued from p. 216.)

Lathyrus pratensis, Linn. Common.

Orobus tuberosus, Linn. IV. Burton-on-Trent, *Harris*; Dale Abbey Woods! Var. *tenuifolius*, Roth. I. Stirrup Woods, Glossop, *Whitelegg*.

Prunus spinosa, Linn. IV. Burton-on-Trent, *Harris*; Repton, *Hagger*; Morley!

P. insititia, Linn. IV. Ockbrook, near Derby!

P. avium, Linn. I. Mellor, *Hannan*. IV. Kedleston, near Derby!

P. Padus, Linn. I. Monk's Dale, *West*; Whatstandwell, Banks of River Derwent!

Spiræa Ulmaria, Linn. Common.

S. Filipendula, Linn. I. Miller's Dale, *Whitelegg*; Hartington, *Harris*; between Newhaven and Middleton; and IV. Between Chellaston and Walton-on-Trent, *Purchas*.

Agrimonia Eupatoria, Linn. Common.

A. odorata, Mill. I. Miller's Dale, *Harris*.

Sanguisorba officinalis, Linn. I. Monk's Dale and Matlock, *West*. IV. Burton-on-Trent, *Harris*; Normanton-by-Derby!

Poterium Sanguisorba, Linn. I. Cromford, *Harris*; Monk's Dale, *West*; Dove Dale!

Alchemilla arvensis, Scop. I. Charlesworth, *Whitelegg*; The Winnatts, Castleton. IV. Cauldwell, *Harris*; Littleover!

A. vulgaris, Linn. Common.

Potentilla Fragariastrum, Ehrh. Common.

P. verna, Linn. I. Dove Dale, *Purchas*; Lathkill Dale, *Smith*; Monsal Dale, *Whitelegg*; Miller's Dale, *Hannan*; Monk's Dale, *West*.

P. Tormentilla, Schenk. Common on heaths.

P. procumbens, Sibth. I. Chatsworth, *Whitelegg*; Dove Dale! IV. Burton-on-Trent, *Harris*.

P. reptans, Linn. Common.

P. Anserina, Linn. Common.

Comarum palustre, Linn. I. Chrome Hill, Buxton! IV. Gresley, *Harris*.

Fragaria vesca, Linn. Common.

F. elatior, Ehrh. IV. Discovered a few years since *by Rev. G. Smith* near Ockbrook; now extinct.

Rubus Idæus, Linn. Common.

R. corylifolius, Sm. I. Miller's Dale, *Pearson*; Cressbrook Dale! IV. Burton-on-Trent, *Harris*.

R. casius, Sm. I. Miller's Dale, *Bailey*; Cressbrook Dale, *Whitelegg*; Chee Dale, *West*. IV. Ockbrook, *Smith*.

R. saxatilis, Linn. I. Miller's Dale, *Harris*; Chee Dale, *West*; Cressbrook Dale, *Whitelegg*; Ashford Dale, *Bailey*; Dove Dale, *Purchas*.

R. Chamæmorus, Linn. I. Kinder Scout, *West*; Axe Edge!

Geum urbanum, Linn. IV. Common.

G. intermedium, Ehrh. I. Bakewell, *Smith*; Chee Tor, *Whitelegg*; Miller's Dale, *Bailey*.

G. rivale, Linn. I. Cressbrook Dale, *Bailey*; Miller's Dale, *Whitelegg*; Lathkill Dale!

Rosa spinosissima, Linn. I. Cressbrook Dale, *Whitelegg*; Monsal Dale, *Smith*.

R. mollissima, Willd. I. Wormhill, *West*; Cressbrook Dale, *Whitelegg*; Dove Dale! IV. Mickleover, near Derby!

R. scabriuscula, Sm. IV. Mickleover, near Derby!

R. Doniana, Woods. I. Monsal Dale!

R. Robertsoni, Baker. I. Monsal Dale!

R. lutetiana, Leman. IV. Morley; Holbrook, near Derby!

R. dumalis, Bechst. I. Buxton! Dove Dale! IV. Breadsall!

R. urbica, Leman. IV. Willington, near Derby!

R. tomentella, Leman. IV. Ockbrook, *Smith*.

R. Reuteri, Godet. I. Cressbrook Dale!

R. subcristata, Baker. I. Dove Dale!

R. Watsoni, Baker. I. Cressbrook Dale!

R. arvensis, Huds. I. Mellor, *Hannan*; Dove Dale! IV. Common.

R. bibracteata, Bast. IV. Holbrook, near Derby!

Cratægus oxyacanthoides, Jacq. I. Wardlow Hay Cop, *Bailey*; Cressbrook Dale, *Hannan*; near Burton-on-Trent, *Harris*.

C. monogyna, Jacq. Common.

Pyrus Aria, Hooker. I. Chee Dale; Blacky Mills; Wormhill, *West*; between Ashbourne and Newhaven, *Purchas*.

P. rupicola, Bosw. I. Miller's Dale, *Whitelegg*; Dove Dale!

P. Aucuparia, Gaertn. Common.

P. Malus, Linn. Common.

Lythrum Salicaria, Linn. IV. Burton-on-Trent, *Harris*; Little Eaton, near Derby!

L. Hyssopifolia, Linn. IV. Calke Park, *Rev. A. Bloxam, Harris*.

Epilobium angustifolium, Linn. I. (?) Ashwood Dale, *Purchas*; Cromford, *Harris*. Var. *brachycarpum*, Leight. I. Burbage, Buxton, garden escape.

E. hirsutum, Linn. I. Miller's Dale! Dove Dale! IV. Burton-on-Trent, *Harris*.

E. parviflorum, Schreb. I. Hassop, *Bailey*. IV. Burton-on-Trent, *Harris*; Canals, Derby!

E. montanum, Linn. Common.

E. obscurum, Schreb. I. Baslow, *Bailey*; near Buxton! IV. Newton Solney, *Harris*.

Circæa lutetiana, Linn. I. Bakewell; Matlock, *West*; Miller's Dale! IV. Burton-on-Trent, *Harris*: Horsley Car, &c.!

Myriophyllum spicatum, Linn. IV. Burton-on-Treut, *Harris*; Locko Park, near Derby!

Hippuris vulgaris, Linn. IV. Bretby Park, *Hagger*.

Callitriche verna, Linn. Common in streams and ponds.

Bryonia dioica, Linn. IV. Common.

Ribes Grossularia, Linn, I. Wormhill, *West*; Whatstandwell! Horsley Castle, Derby! IV. Burton-on-Trent, *Harris*.

R. alpinum, Linn. I. Wormhill, *West*; Miller's Dale, *Whitelegg*; Dove Dale, *Purchas*.

R. rubrum, Linn. I. Mellor, *Hannan*; Monk's Dale, *West*.

R. nigrum, Linn. I. Wormhill, *West*; Whatstandwell!

Sedum Telephium, Linn. I. Monk's Dale; Cromford, *West*; Dove Dale! Chrome Hill!

S. album, Linn. I. Ashford-in-the-Water, *Harris*; Matlock Bath, *Whitelegg*.

S. anglicum, Hudson. I. Chatsworth, *Harris*.

S. acre, Linn. Common.

S. reflexum, Linn. IV. Repton!

Cotyledon Umbilicus, Linn. IV. Near Repton, *Playne*.

Saxifraga tridactylites, Linn. Common.

S. granulata, Linn. I. and IV. Common in meadows.

S. hypnoides, Linn. I. Bakewell Road, Buxton! Dove Dale! Var. *gemmifera*, E. B. I. Cressbrook Dale, *Bailey*.

Chrysosplenium oppositifolium, Linn. I. Mottram, *Bailey*; Mellor, *Hannan*; Miller's Dale, *Whitelegg*; Dove Dale! IV. Burton-on-Trent, *Harris*; Dale Abbey Woods! Morley!

C. alternifolium, Linn. I. Disley; Ashwood Dale; Miller's Dale, *Whitelegg*; near Ashbourne, *Purchas*; Turnditch, *Whittaker*. IV. Wyaston Brook, *Smith*.

Parnassia palustris, Linn. I. Hartington; upper part of Dove Dale, *Purchas*; Monsal Dale, *Harris*; Buxton!

Hydrocotyle vulgaris, Linn. IV. Burton-on-Trent, *Harris*; Morley Moor!

Sanicula europæa, Linn. I. Disley, *Bailey*; Via Gellia! IV. Burton-on-Trent, *Harris*; Repton Shrubs!

Helosciadum nodiflorum, Koch. IV. Gresley, *Harris*; common, Derby!

H. repens, Koch. I. Miller's Dale!

H. inundatum, Koch. IV. Burton-on-Trent, *Harris*; Swarkestone Bridge!

Sison Amomum, Linn. IV. Lullington, *Harris*; Spondon!

Aegopodium Podagraria, Linn. I. Turnditch! IV. Burton-on-Trent, *Harris*.

Bunium flexuosum, With. Common.

Pimpinella Saxifraga, Linn. Common.

P. magna, Linn. I. Monk's Dale, *West*; Ashwood Dale! Dove Dale! Via Gellia! IV. Burton-on-Trent, *Harris*; Ockbrook!

Sium angustifolium, Linn. I. Youlgreave, *Bailey*; Dove Dale! IV. Burton-on-Trent, *Harris*; Derby!

Oenanthe fistulosa, Linn. IV. Burton-on-Trent, *Harris*; Alvaston, *Smith*; Swarkestone Bridge!

Oe. Phellandrium, Linn. IV. Burton-on-Trent, *Harris*; Swarkestone Bridge!

Oe. fluviatilis, Coleman. IV. Burton-on-Trent, *Harris*.

Aethusa Cynapium, Linn. I. Dove Dale! IV. Burton-on-Trent, *Harris*.

Silaus pratensis, Bess. IV. Drakelowe, *Harris*; Ockbrook, *Smith.*

Angelica sylvestris, Linn. I. Buxton! Matlock Bath! IV. Burton-on-Trent, *Harris.*

Pastinaca sativa, Linn. IV. Chaddesden, Derby!

Heracleum Sphondylium, Linn. Common. A variety with narrow leaves, Miller's Dale, *Whitelegg.*

Daucus Carota, Linn. I. Dove Dale! IV. Calke, *Hagger*; Burton-on-Trent, *Harris.*

Torilis Anthriscus, Gaertn. Common.

Chærophyllum sylvestre, Linn. Common.

C. temulum, Linn. Common.

Myrrhis odorata, Scop. I. Matlock Bath, *Harris*; Cromford! Whatstandwell! IV. Breadsall, *Whittaker.*

Conium maculatum, Linn. IV. Foremark, *Harris*; Ockbrook!

Hedera Helix, Linn. Common.

Cornus sanguinea, Linn. I. Miller's Dale, Matlock, *West*; Dove Dale! IV. Burton-on-Trent, *Harris*; Mickleover!

Viscum album, Linn. IV. Morley, *Whittaker.*

Adoxa Moschatellina, Linn. I. Monsal Dale! IV. Winshill, *Harris*; Morley!

Sambucus nigra, Linn. Common.

Viburnum Opulus, Linn. I. Charlesworth, *Hannan*; Monk's Dale, *West.* IV. Morley, *Whittaker*; Breadsall!

Lonicera Periclymenum, Linn. Common.

Galium Cruciata, With. Common.

G. verum, Linn. Common.

G. saxatile, Linn. Common on heaths!

G. sylvestre, Poll. I. Castleton, *West*; Ashford Dale, *Whitelegg*; Dove Dale!

G. palustre, Linn. Wet moors.

G. uliginosum, Linn. I. Axe Edge!

G. aparine, Linn. Common.

Asperula odorata, Linn. I. Moors! IV. Repton Shrubs, *Harris.*

Sherardia arvensis, Linn. I. Miller's Dale, *West*; Lathkill Dale! IV. Drakelowe; Linton, *Harris*; Derby!

Valeriana dioica, Linn. I. Via Gellia! IV. Morley, *Whittaker*; Drakelowe, *Harris.*

V. officinalis, Linn. I. Buxton! Dove Dale! IV. Repton, *Hagger*; Burton-on-Trent, *Harris.*

Valerianella olitoria, Mœnch. I. Matlock Bath! IV. Cauldwell, *Harris*; Morley;

V. dentata, Koch. I. Miller's Dale, *West.* IV. Cauldwell, *Harris*; Morley! Ockbrook!

Dipsacus sylvestris, Linn. IV. Chaddesden! Swarkestone Bridge! Ticknall, *Hagger.*

D. pilosus, Linn. I. Via Gellia, *Whitelegg.* IV. Newton Solney, *Harris.*

Scabiosa Succisa, Linn. I. Dove Dale! IV. Ockbrook! Gresley, *Harris.*

S. Columbaria, Linn. I. Dove Dale! Buxton!

S. arvensis, Linn. Common.

Carduus nutans, Linn. Common.

C. crispus, Linn. Common. Var. *acanthoides*, Linn. I. Ashwood Dale!

C. lanceolatus, Linn. Common.

C. palustris, Linn. Common.

C. heterophyllus, Linn. I. Monk's Dale, *West*; Curbar Wood! Ashwood Dale, Buxton!

C. arvensis, Curt. Common.

Carlina vulgaris, Linn. I. Blackwell Dale, *Bailey*; Wormhill, *West*; Axe Edge! Dove Dale!

Arctium majus, Schkuhr. I. Ashwood Dale! Monsal Dale! Winnatts, Castleton! IV. Burton-on-Trent, *Harris*.

Serratula tinctoria, Linn. I. Buxton, *Hannan*; Wormhill; Matlock, *West*. IV. Repton Shrubs, *Harris*; Etwall Road, Repton, *Hagger*.

Centaurea nigra, Linn. Common.

C. Scabiosa, Linn. I. Wormhill; Matlock, *West*; Ashwood Dale! Dove Dale!

Chrysanthemum segetum, Linn. IV. Milton, near Repton, *Hayger*; Drakelowe, *Harris*; Normanton-by-Derby!

C. Leucanthemum, Linn. Common.

Matricaria Parthenium, Linn. I. Brambley, *Bailey*. IV. Newton Solney, *Harris*; Swarkestone!

M. inodora, Linn. I. Baslow, *Bailey*. IV. Burton-on-Trent, *Harris*; Morley!

Tanacetum vulgare, Linn. IV. Egginton, *Harris*; R. Derwent, Derby!

Anthemis nobilis, Linn. IV. Ockbrook! Morley Moor!

Achillea Millefolium, Linn. Common.

A. Ptarmica, Linn. IV. Willington, *Hagger*; Gresley, *Harris*.

Artemisia vulgaris, Linn. IV. R. Derwent, Derby! Burton-on-Trent, *Harris*.

Gnaphalium uliginosum, Linn. IV. Burton-on-Trent, *Harris*; Chellaston! Morley Moor!

G. sylvaticum, Linn. I. Newhaven! IV. Osmaston-by-Ashbourne, *Smith*.

G. dioicum, Linn. I. Glossop, *West*; Axe Edge, Wild.

Senecio vulgaris, Linn. Common.

S. sylvaticus, Linn. IV. Willington! Breadsall Moor!

S. erucifolius, Linn. I. Matlock Bridge, *Hannan*.

S. Jacobæa, Linn. Common.

S. aquaticus, Huds. Common.

Bidens cernua, Linn. IV. Locko Park, near Derby!

B. tripartita, Linn. IV. Burton-on-Trent, *Harris*; canals, Derby!

Inula Conyza, DC. I. Matlock Bath!

I. dysenterica, Linn. IV. Common.

Bellis perennis, Linn. Common.

Solidago Virga-aurea, Linn. I. Buxton! Matlock Bath! IV. Gresley, *Harris*.

Tussilago Farfara, Linn. Common.
Petasites vulgaris, Desf. Common.
Eupatorium cannabinum, Linn. I. Matlock Bath; Dove Dale! IV. Burton-on-Trent, *Harris*.
Lapsana communis, Linn. Common.
Hypochæris radicata, Linn. IV. Gresley, *Harris*; Ockbrook!
Leontodon hispidus, Linn. Common.
L. autumnalis, Linn. Common.
Picris hieracioides, Linn. I. Ashwood Dale! Miller's Dale! Dove Dale! IV. Newton Solney, *Harris*; common about Derby!
Tragopogon pratensis, Linn., var. *minor*, Fries. IV. Stapenhill. *Harris*; Breadsall! Ockbrook!
Taraxacum Dens-leonis, Linn. Common. Var. *lævigatum*. IV. Normanton by-Derby!
Lactuca muralis, Fresen. I. Common on limestone! IV. Winshill, *Harris*; Morley!
Sonchus asper, Hoffm. IV. Stapenhill, *Harris*; Chellaston! Swarkestone!
S. arvensis, Linn. IV. Stapenhill, *Harris*: Ockbrook!
Crepis virens, Linn. Common.
Hieracium Pilosella, Linn. Common on heaths.
H. cæsium, Fries. I. Monsal Dale; Blackwell Dale, *Whitelegg*; Castleton, *Whitehead*; Dove Dale;
H. vulgatum, Fries. I. Miller's Dale, *West*; Buxton! Matlock Bath! Dove Dale! IV. Repton!
H. tridentatum, Fries. IV. Coton-in-the-Elms, *Harris*.
H. prenanthoides, Vill. I. Miller's Dale, *Whitelegg*.
H. umbellatum, Linn. I. Goyt's Bridge, Buxton! IV. Egginton, *Harris*; Willington!
H. boreale, Fries. I. Common, woods and heaths.
Jasione montana, Linn. I. Ambergate, *Harris*; Dove Dale! Duffield!
Campanula glomerata, Linn. I. Rare!
C. Trachelium, Linn. I. Monks Dale, *West*: Miller's Dale, *Bailey*; Dove Dale!
C. latifolia, Linn. I. Baslow, *Bailey*; Marple, *Whitehead*: Matlock and Miller's Dale, *West*! Cressbrook Dale! Monsal Dale! Castleton! IV. Repton Rocks, *Harris*; Repton Shrubs!
C. rotundifolia, Linn. Common.
C. patula, Linn. IV. Stapenhill, *Harris*.
Vaccinium Oxycoccos, Linn. I. Threve Edge, Buxton! Axe Edge; Coombes Moss, *West*; Charlesworth, *Whitehead*.
V. Vitis-idæa, Linn. I. Glossop Moors, *Bailey*; Axe Edge!
V. Myrtillus, Linn. Common on moors.
Arctostaphylos Uva-ursi, Wimm. I. Stenior Clough, Kinder Scout, *Whitehead*; near Cock's Bridge, Kinder Scout, *Wild*.
Erica Tetralix, Linn. I, IV. Common on moors.
E. cinerea, Linn. I. Goyt's Clough! IV. Shirley Wood, *Smith*.
Calluna vulgaris, Salisb. I. Common on moors. IV. Gresley, *Harris*.

Ligustrum vulgare, Linn. I. Ashford Dale, *Hannan*; Monk's Dale, *West*. IV. Mickleover! Burton-on-Trent, *Harris*.

Erythræa Centaurium, Pers. I. Dove Dale! IV. Burton-on-Trent, *Harris*; Ockbrook!

Gentiana Amarella, Linn. I. Buxton! Wormhill, *West*; Crich, *Whitelegg*!

Polemonium cæruleum, Linn. I. Buxton! Ashford Dale; Youlgreave, *Bailey*; Dove Dale, *Purchas*; Chrome Hill, Buxton! IV. Drakelowe, *Harris*.

Convolvulus arvensis, Linn. IV. Common.

C. sepium, Linn. IV. Common.

Solanum Dulcamara, Linn. IV. Common.

Hyoscyamus niger, Linn. I. Over Haddon, *Bailey*. IV. Stapenhill, *Harris*.

Verbascum Thapsus, Linn. I. Cromford, *Harris*; Dove Dale! IV. Ticknall, *Hagger*.

V. Lychnitis, Linn. I. Rare.

V. nigrum, Linn. I. Alport, *Bailey & Purchas*.

Scrophularia Balbisii, Horn. IV. Common.

S. nodosa, Linn. IV. Common.

Digitalis purpurea, Linn. Common.

Linaria Cymbalaria, Mill. I. Matlock Bath!

L. vulgaris, Mill. I. Dove Dale! IV. Common.

L. minor, Desf. I. Miller's Dale, *Whitelegg*; near Peak Forest Railway Station, *Wild*.

Veronica hederifolia, Linn. IV. Common.

V. polita, Fries. IV. Ockbrook, *Smith*; Milton, *Harris*.

V. agrestis, Linn. IV. Common.

V. Buxbaumii, Linn. IV. Burton-on-Trent, *Harris*; Chellaston! Derby!

V. arvensis, Linn. IV. Common.

V. serpyllifolia, Linn. Common.

V. officinalis, Linn. I. Axe Edge! IV. Morley! Burton-on-Trent, *Harris*.

V. Chamædrys, Linn. Common.

V. montana, Linn. IV. Repton Shrubs, *Harris*; Dale Abbey Woods!

V. scutellata, Linn. I. Coombe's Moss! IV. Burton-on-Trent, *Harris*; Morley Moor!

V. Anagallis, Linn. Common.

V. Beccabunga, Linn. Common.

Euphrasia officinalis, Linn. I. Heaths and hilly pastures.

Bartsia Odontites, Huds. I, IV. Heaths, common.

Pedicularis palustris, Linn. IV. Repton Rocks, *Harris*.

P. sylvatica, Linn. IV. Ockbrook! Morley!

Rhinanthus Crista-galli, Linn. Common.

Melampyrum pratense, Linn. Heaths, common.

Lathræa Squamaria, Linn. I. Mellor, *Hannan*; Matlock Bath, *Harris*; Via Gellia! Monsal Dale! IV. Dale Abbey Woods!

(To be continued).

SHORT NOTES.

Viola lactea, Sm., in Bucks.—While botanising with Mr. Bolton King, of Balliol College, in Dropmore Park, on some damp heathy ground near the artificial water, we found a few specimens of *Viola lactea;* in a small pond near, *Littorella lacustris*, *Peplis Portula*, and fine *Callitriche hamulata* were seen.—G. C. Druce.

Viola arenaria, DC., and Polygala uliginosa Reich., in Teesdale.—In the 'Report of the Botanical Record Club for 1874,' Dr. F. A. Lees speaks of the probability of these two plants being extinct. It may therefore interest British botanists to know that these Teesdale rarities have been gathered this June by Mr. H. T. Mennell. The latter occurs in several places with blue and pink flowers. I have living specimens of both, and also of *Alsine uliginosa*, Schleich., by Mr. Mennell's kindness.—A. Bennett.

Zannichellia macrostemon, Gay.—This has been found lately in the canal near Oxford, and also in the Thames, growing in rather shallow water on muddy bottom. In Northamptonshire and Bucks it occurred in the Grand Junction Canal between Wolverton and Cosgrove. The aggregate plant is not recorded in 'Top. Bot.' for either Berks or Bucks, and the above segregate is on very sparing record for Britain, although doubtless overlooked. Typical *palustris* is rare in Oxfordshire, but it is found in a brook near Headington Wick farm. In Northamptonshire it occurs at Kingsthorpe, Potters Pury, Castle Ashby, and Moreton Pinkney.—G. C. Druce.

Rubus spectabilis, Pursh, as a naturalised plant. — This shrub, a native of North-West America, conspicuous for its deep claret-coloured petals and orange-yellow fruit, has been for years naturalised and is largely increasing in a wood not far from Sandling Park, Hythe, Kent. It may have originally escaped from the rectory-gardens at Saltwood, some half mile distant; but it has been known by the villagers to occur for thirty or more years in the above mentioned locality in a quasi-wild state, and has even acquired the local appellation of "The Woodman's Rose."—J. Cosmo Melvill.

Scirpus pauciflorus in Berks.—This plant occurs in considerable quantity in some meadows between South Hinksey and the Abingdon road, near Oxford, accompanied by *Rhynchospora alba*.—G. C. Druce.

North Buckinghamshire Plants.—The following plants, mostly new records to 'Topographical Botany,' have been lately noticed in North Bucks, principally near the Bedford and Northampton boundaries. The district of Brickhill is especially rich, and would

doubtless repay systematic search :—*Ranunculus parviflorus*, L., by the road-side near Calverton, where it was shown me by the Rev. H. Wood.—*Helleborus fœtidus*, L., in hedgerows and thickets at Hanslope; and between Yardley Close and Olney I should be inclined to consider it native.—*Corydalis claviculata*, DC., plentiful in Bow Brickhill woods.—*Cardamine amara*, L., very frequent by canal-side near Wolverton.—*Apium graveolens*, L., brook between Walton and Bow Brickhill, also near Simpson and Woughton.—*Trifolium medium*, L., thicket by road-side near Denbigh-hall.—*Sedum Fabaria*, L., Bow Brickhill woods.—*Rosa tomentella*, Leman, hedge at Beachampton.—*Rosa dumalis*, Bech., and *R. urbica*, W., Calverton hedgerow, rather common in many places. — *Pyrus communis*, L., Woughton on the Green hedgerow. — *Valeriana Mikanii* is the commoner segregate in the portions of Bucks I have been over.—*Vaccinium Myrtillus*, L., Bow Brickhill woods.—*Rumex nemorosus*, Schrad., Leckhampstead. — *Salix fragilis*, L., near Beachampton, Ouse side.—*S. cinerea*, L., Bow Brickhill woods.—*Ophrys apifera*, Huds., rail-banks near Denbigh-hall.—*Potamogeton zosteræfolius*, Schum., Grand Junction Canal between Wolverton and Cosgrove (Bucks and Northampton), with *P. mucronatus* and *P. pectinatus*.—*P. natans*, E. B., pond near Bletchley, Beachampton, &c.—*Juncus glaucus*, Sibth., common and generally distributed.—*Scirpus setaceus*, L., Bow Brickhill woods.—*Carex panicea*, L., Hanslope rail-banks.—*C. pendula*, L., in a lane near Hanslope.—*Aira præcox*, L., Bow Brickhill.—*Chara fœtida*, L., canal, Wolverton. —G. C. Druce.

Extracts and Notices of Books and Memoirs.

OFFICIAL REPORT FOR 1880 *OF THE DEPARTMENT OF BOTANY IN THE BRITISH MUSEUM.*

By W. Carruthers, F.R.S.

The ordinary work of the Department has necessarily been interrupted by the preparations for, and the actual removal of the collections to the New Museum, and by the subsequent arranging of the collections in the galleries allocated to the Department in the new building. The Herbarium was inaccessible to scientific men only during the two weeks when it was being transported from Bloomsbury to Kensington. The collection of fruits and seeds has been placed alongside of the plants in the great Herbarium, and arranged in the same order. Owing to the want of fittings in the public gallery, only a small portion of the exhibited collections were transferred to Kensington in 1880.

Attention has been given to the formation of a good working library for the Department, rendered necessary by the separation of the collections from the Museum Library. Considerable time has been spent in selecting and collating suitable books. An important addition to the library was received from John W. Miers, Esq., who presented the works which his father, the late John

Miers, F.R.S., used when engaged on the numerous botanical memoirs he published. These works were annotated by him in relation to the plants in his herbarium, which was bequeathed to the trustees, and became their property in 1879. Sixty eight works, many of them voluminous and expensive illustrated publications, were presented by Mr. Miers, who desired that the books and plants should remain associated.

While continuous work in the Herbarium has not been possible, many small collections have been incorporated during the year, especially of plants belonging to the Natural Orders *Sterculiaceæ*, *Resedaceæ*, *Cruciferæ*, and *Gentianaceæ*. The plants of Chelsea Gardens have been mounted and incorporated with the Herbarium. In the course of the work the following Natural Orders have been more or less re-arranged: — *Capparideæ*, *Malvaceæ*, *Rubiaceæ*, *Orchideæ*, *Musci*, *Algæ*, and *Fungi*.

There have been added to the Herbarium during the year a valuable collection of plants from the Kurrum Valley, Afghanistan, consisting of 422 species, formed and presented by Dr. J. E. T. Aitchison; 125 species of plants from Java, collected by Forbes; 725 species of plants from Astrakan; 151 species of plants from Songoria, collected by Schrenk; an interesting collection from Natal, by the Rev. W. Greenstock; a small collection from the Sierra Nevada, Columbia, made by F. A. Simmons; a collection from Guatemala, made by Keck, and from the Argentine Republic, by Hieronymus; 984 plants of Northern Africa, collected by Gandoger; 468 species from the South of Spain, collected by Huter, Porta, and Rigo; 443 species from Italy, collected by Strobl; and 200 species from Sicily, collected by Lojacona. To the collection of cryptogamic plants have been added 144 species of Ferns from Madagascar, collected by the Rev. G. Shaw; 50 species from Trinidad, collected by Fendler, and 150 species from Italy, in continuation of the collections of the Cryptogamic Society; a small series of *Hepaticæ*, in continuation from Rabenhorst, and 100 mosses from Fiedler; 100 species of European Lichens, by Rabenhorst; and 150 from Egypt, collected by Larbalestier; 300 species of European Algæ, collected and named by Le Joli; a small collection by Rabenhorst, and another of Scandinavian species, by Wittrock and Nordstedt; 400 species of Fungi, by Thuemen; 120 species by Spegazzini; 100 species by Rehm; 100 species by Oudeman; and the same same number from Kunze.

To the British Herbarium there have been added during the year a large collection of the plants of Oxfordshire, formed by the late Alfred French, and consisting of 2482 specimens; and the important Herbarium of Lichens, formed by Mr. W. Joshua, containing 976 species (a small proportion being European), represented by 1500 labelled specimens. In addition to these, there have been acquired a complete set of Dr. Cocks's Algæ, consisting of 180 species, and a similar set of Chalmers's Scottish Algæ, consisting of 100 species; and a collection of 350 species of Lichens, found by Larbalestier.

To the histological collection there have been added 120

preparations of Fungi, by Zimmerman, and 189 preparations of cellular plants by Joshua.

The collection of fruits and seeds has received a series of fruits from Java, from Mr. Forbes, including fine specimens of *Pandanus macrocarpus*.

To the collection of objects suitable for exhibition have been added a large specimen of *Welwitschia mirabilis*, stems of *Cycas revoluta*, and of a *Xanthorrhea*, a section of the stem of *Borassus æthiopicus*, a fine leaf of *Corypha umbraculifera*, a branch with cones of *Pinus Edgariana*, and several specimens of wood presented by Sir Joseph D. Hooker, Director of Kew Gardens; 303 specimens of Indian woods from the India Museum, through the Director of Kew Garders; stems of *Areca concinna*, *Bauhinia scandens*, *Entada scandens*, *Flacourtia Cataphracta*, *Anamirta Cocculus*, *Carallia integerrima*, *Desmoncus major*, *Dæmonorops filare*, *Calamus rudentum*, *Ficus elastica*, and *Bombax malabaricum*, and the rhizome and stem of *Bambusa Thouarsii*, presented by Dr. Trimen, Director of the Botanic Gardens, Peradenya, Ceylon; stems of *Metroxylon læve*, *Cycas circinalis*, *Areca Catechu*, and *Alsophila*, and specimens of *Myrmecodia* from Java, collected by Mr. Forbes.

The collection of drawings and engravings of plants has been considerably increased during the year. A large series, formed by the late W. Wilson Saunders, was purchased, and is being incorporated with the general collection, together with 2517 further drawings and engravings. Five volumes, containing 928 original drawings of the ramifications of plants, made by John Miller for John, Earl of Bute, have been acquired; and twenty-five original drawings of Fungi by W. G. Smith.

The number of visits paid during the year to the Herbarium for scientific inquiry and research was 788. The following foreign botanists may be specified as having used the Herbarium in connection with their investigations:—M. A. DeCandolle, of Geneva; Prof. Asa Gray, of America; Prof. Engler, of Kiel; Dr. Haussknecht, of Weimar; Dr. Rehman, of Cracow; Baron Ettingshausen, of Gratz; and the Rev. L. Menyharth, of Innsbruck. Of British botanists, the following may be specified:—Mr. J. G. Baker, Mr. A. W. Bennett, Mr. A. Bennett, Mr. Bisset, Dr. Braithwaite, Mr. C. B. Clarke, Rev. J. M. Crombie, the Messrs. Groves, Mr. W. P. Hiern, Mr. E. M. Holmes, Mr. Howse, Mr. B. Daydon Jackson, Mr. J. C. Mansel-Pleydell, Mr. S. le M. Moore, and the Rev. W. W. Newbould.

Mr. W. B. Hemsley has begun to publish, in the 'Gardeners' Chronicle,' a "List of Garden Orchids," which bids fair to be a very useful compilation. The arrangement of the genera is that which will be adopted in the 'Genera Plantarum,' beginning with *Pleurothallis*; and Mr. Hemsley has been fortunate in obtaining the help of Mr. Bentham, who has "most generously placed the whole of his references, together with the manuscript descriptions of the genera, at the disposal of the compiler." The arrangement of the species is alphabetical.

The third volume of the 'Monographiæ Phanerogarum,' of the MM. DeCandolle, just issued, contains the following monographs:—*Philydraceæ*, by Professor Caruel; *Alismaceæ*, *Butomaceæ*, and *Juncaginеæ*, by M. Micheli; *Commelinaceæ*, by Mr. C. B. Clarke; and *Cucurbitaceæ*, by M. A. Cogniaux.

Two further Supplements to Baron von Mueller's 'Fragmenta' have reached us, the first containing an enumeration of Australian *Characeæ*, compiled from Braun's writings; of Mosses, by Hampe (his last work); of *Hepaticæ*, by Gottsche; and of Lichens, by Krempelhuber: the second containing a list of the Fungi, compiled by Dr. Cooke, with subsequent additions by Baron von Mueller.

Under the title 'Tavole per una Anatomia delle Piante Aquatiche,' some very beautiful plates have been published at Florence under the superintendence of Prof. Caruel. They were designed for a work by the late Prof. Parlatore, which he did not live to complete.

We are glad to announce the appearance of the third part of Nyman's admirable 'Conspectus Floræ Europææ,' in which the enumeration is carried to the end of the Dicotyledons. One more part will complete the work, to which we hope a full index will be added.

New Books.—A. & C. DeCandolle, 'Monographiæ Phanerogarum,' vol. iii. (Paris, Masson, 30fr.).—C. F. Nyman, 'Conspectus Floræ Europææ,' pt. iii. (*Corolliflorae—Monochlamydeæ*).—L. Giesenheyner, 'Flora von Kreuznach (Kreuznach, Schmithals). — P. Sydow, 'Die Moose Deutchslands' (Berlin, Stubenrauch).—E. Fiek, 'Flora von Schlesien' (Breslau, Kern).—S. Schlitzberger, 'Standpunkt und Fortschrift der Wissenschaft in der Mykologie' (Berlin, Stubenrauch).

Articles in Journals.—June.

Botanical Gazette.—E. L. Greene, 'New Plants of New Mexico and Arizora' (*Vicia leucophæa*, *Phaseolus parvulus*, *Polemonium flavum*, *Pentstemon pauciflorus*, *P. pinifolius*, *Habenaria brevifolia*, spp. nov.).—G. Engelmann, 'Additions to North American Flora' (*Dicentra ochroleuca*, *Tsuga caroliniana*, *Yucca macrocarpa*, *Juncus rugulosus*, spp. nov.).—C. H. Peck, 'New species of Fungi' (*Puccinia*).

Bot. Zeitung.—H. Hoffmann. 'Retrospect of Researches in Variation in 1855–1880.'—J. Wörtmann, 'On the Biology of *Mucorineæ*.'—F. A. Tocherning, 'On the Embryo of *Cucurbitaceæ*.'

Flora (May).—F. Arnold, 'Lichenological Fragments' (concluded).—J. Freyer, 'Phytographical Notices' (*Achillea fililoba*, *Carduus xanthacanthus*, *Hieracium asperulum*, spp. nov).—F. M. Fries, 'Notes on Ehrhart's Lichens.'—J. Müller, 'Lichenological Studies.'—Diagnoses of Thümen's 'Mycotheca Universalis.'—(June). C. Nörner, 'On the development of the Embryo in *Gramineæ*' (4 tt.).—Diagnoses of Thümen's 'Mycotheca Universalis' (concluded).

Hedwigia (May).—G. Winter, 'Notes on *Discomycetes*.'—(June). P. Richter, 'On *Diatomaceæ*.'

Journal of Linnean Society (Botany, vol. xviii. no. 112, June 3).—F. Darwin, 'On the Position of Leaves with regard to Light.'—G. Henslow, 'Proliferous condition of *Verbascum nigrum*' (2 tt.).—W. Bidie, 'On the Indian Coffee-leaf Disease.'—M. C. Cooke, 'The Coffee-leaf Disease in S. America' (2 tab.).—A. C. Christie, 'Stipules in *Ilex Aquifolium*.'—C. B. Clarke, 'On Right-hand and Left-hand Contortion.'

Journal of Royal Microscopical Society.—W. H. Shrubsole and F. Kitton, 'The Diatoms of the London Clay.'

Naturalist.—W. West, 'Yorkshire Naturalists' Union Cryptogamic Report for 1880.'

Oesterr. Bot. Zeitschrift.—T. F. Hanausek, 'On the fruit of *Fuchsia luxurians*.'—Heidenreich, 'A *Carex* (*C. vitilis*) new to N. Germany.'—S. S. v. Muggenburg, 'Mycological Notes.'—H. Steininger, 'Flora of the Bodenweis' (concluded).—P. Sintenis, 'Cyprus and its Flora' (continued).—P. G. Strobl, 'Flora of Etna' (continued).

Botanical News.

British botanists will learn with deep regret that Mr. H. C. Watson died at Thames Ditton on the 27th of last month. We hope to give an extended notice of this eminent botanical writer in an early number.

Dr. Asa Gray, the veteran American botanist, is staying in England for the summer, and is working assiduously at the National Herbarium, South Kensington, and the Herbarium of the Royal Gardens, Kew.

Prof. Babington has been appointed President of the Cambrian Archæological Society. We are glad to learn that a new edition (the eighth) of his 'Manual of British Botany' is in active preparation.

We regret to announce the death, in Madagascar, of Dr. J. M. Hildebrandt, the well-known botanical traveller.

A Free Library has been opened at Richmond, Surrey, being the first which has been established within the London radius under the Free Public Libraries Act. The income being very small, it has been endeavoured, with considerable success, to supplement it by donations of books; and several of the more important literary societies have contributed their publications. The number of scientific books of reference at present upon the shelves is comparatively small and inadequate, and we gladly call the attention of our readers to the circumstance in the hope that some among them may contribute to remedy this deficiency. The Editor of this Journal will be glad to receive and acknowledge any contributions; or they may be sent direct to the Librarian, Mr. A. Cotgreave, Free Public Library, Richmond, Surrey.

Original Articles.

IN MEMORY OF HEWETT COTTRELL WATSON.

By J. G. Baker, F.R.S.

We have this month to mourn the loss of our veteran English botanical geographer, Hewett Cottrell Watson, who died at his residence at Thames Ditton, near Kingston, on Wednesday, the 27th of July, in the seventy-eighth year of his age. Shortly before Christmas he had an accident whilst working in his garden; he stepped backward against a heap of soil and rubbish which he did not notice, and injured his foot and leg, which was lame before. Acute inflammation set in, which resulted in gangrene, and he had been confined to his bedroom ever since Christmas; and, although until the last fortnight he had been able to dress and lie on the sofa during the day, at times he suffered great pain, and his strength became gradually exhausted.

He was born in the month of May, 1804, at Firbeck, a village on the Yorkshire side of the boundary between that county and Nottinghamshire, not far from Worksop. When he was six years old the family removed to Congleton, in Cheshire. His father was Holland Watson, a country gentleman of antiquarian tastes and a magistrate for the counties both of Cheshire and Lancashire. On his mother's side he was descended from the Lords Folliott, of Ballyshannon. But, although upon both sides he could trace back his descent for many generations through ancestors of good social position, he was from a very early period of his life an uncompromising democrat, not merely passively and theoretically, but taking a lively active interest in political affairs. In Mid-Surrey, where he lived for the last forty years of his life, he was one of the most active supporters of the liberal side in an overwhelmingly tory constituency; and one his of last acts was to undertake a canvass from house to house of his parish at the election of last year. In matters theological his views—which were much less common forty years ago than they are now—were of the advanced broad school. The society in which he moved was principally composed of men of very different opinions; and, as he delighted to speak out his mind freely, he was constantly drawn into animated arguments on social and political questions, in which, with his ready sarcasm and great command of illustrative recollections and anecdotes, no one was better qualified to hold his own against all comers.

When he was a child, Dr. Stanley, afterwards Bishop of Norwich, was the rector of the neighbouring parish of Alderley, and Mr. Watson always considered that it was from him that his

love for Botany got its first encouragement. "During my school-days," he wrote, "a boyish fancy for plants and floriculture, which I had early inherited, attracted the favourable notice of Dr. Stanley, whose opportune instruction and encouragement gave a scientific direction to the taste, and rendered it the solace and relief of the child during a period of protracted bodily suffering. The direction once given was never wholly lost, though discouraged in my own home and the means of improvement withheld under mistaken views." The late Dean Stanley was one of his schoolfellows, and as he was a frail delicate child, Mr. Watson, who was ten years older, often gave him cakes and interfered for his protection.

At first he was intended for the army, but at an early age an accident from a cricket bat, which ruined in permanence the joint of one of his knees, put a stop to this. His father wished him to be a lawyer, but, although he followed up for some time the necessary studies, the idea was never congenial to his own mind. When he was about twenty-two, the bequest of a small estate in Derbyshire from a member of his mother's family placed him in what for a man of his simple habits were independent circumstances. Upon this he removed to Edinburgh, where he stayed for several years, attending the ordinary classes of the medical curriculum, and giving special attention to Botany and Physiology. Just as he was going up for his examination his health broke down, and he was not able to go up for his degree; and, as he did not wish to practice, he never took it. After travelling about for some time he purchased, about 1835, a small house (which he afterwards enlarged) with a pleasant garden and orchard attached to it, a short distance north of the village of Thames Ditton, a stone's-throw from the point where the branch to Hampton Court leaves the main London and South Western line; and here he lived for the remainder of his life. He never married, but was fortunate in that the same housekeeper who came to him when he first settled down in a house of his own remained with him for the whole forty-six years, and nursed him through his last tedious illness.

During his Edinburgh studentship he took great interest in the lectures of Professor Graham, whom he accompanied in an excursion into Sutherlandshire. Amongst his Edinburgh contemporaries who took special interest in Botany were Dr. Balfour, Dr. Greville, Dr. Patrick Neill, Sir Walter Trevelyan, and Mr. Embleton; and in those early days when he first settled down definitely into botanical work no one did more to help and encourage him than Sir William Hooker, to whom Dr. Graham gave him an introduction, who was then in the full tide of his professional career at Glasgow. He accompanied Sir William and his class upon several of their Highland excursions, and dedicated to him 'The New Botanist's Guide,' which he published in 1835.

The following is what George Combe wrote of Mr. Watson in 1846, when he was a candidate for one of the Professorships in the four Queen's Colleges, then just established in Ireland:—"Mr. H. C. Watson became known to me nearly twenty years ago, when he studied in this city, and my acquaintance with him has been

continued to the present time. As a student he was characterized by steady application, great aptitude in acquiring knowledge, and a comprehensive power of appreciating its relations. He devoted his attention to the various branches of science usually included in the curriculum for a medical degree, and was elected by his fellow-students President of the Royal Medical Society of Edinburgh, in which office he distinguished himself by superior abilities and attainments. Judging from his writings, conversation, and correspondence, I have no hesitation in saying that his intellect is acute, exact, profound, comprehensive, and logical in no ordinary degree. He combines the powers of accurate observation, analysis, and induction, with the power of clear expression; and his manner of communicating the great and valuable store of scientific information which he possesses is at at once lucid and logical. I have considered his personal friendship as a source of pleasure and advantage ever since I knew him, and shall consider any College or University fortunate that shall enrol him amongst its professors in the branch of science to which he has devoted his chief attention—Botany."

The following is Sir J. D. Hooker's testimonial of the same date:—"Mr. H. C. Watson has been personally known to me for nearly fourteen years as a zealous and excellent botanist, from whose writings and experience I have derived great instruction. His knowledge of plants is very extensive, and of European, especially British, species, complete, and acquired by actual investigation. In the departments of physiological, structural, and systematic Botany he is well grounded; and his numerous works on that of Geographical Botany are pronounced by all to be of the highest order. Mr. Watson's education, general information, and gentlemanly manners, together with his desire of, and facility in, imparting information are so obvious, that his society was greatly desired both by the professors and students in Botany in Edinburgh and Glasgow, during the many seasons when as a distinguished student of Dr. Graham he devoted himself to the study of the geographical distribution of the British Flora."

As a writer on the geographical distribution of the British plants his books extend over more than forty years, beginning with 1832, when he was twenty-eight years old, and ending with 1874. From first to last, so far as Botany was concerned, he concentrated his attention upon this special field, and worked at it with unremitting diligence and patience. The paragraph from Herschell which he chose as a motto for the 'Cybele' indicates with characteristic clearness the spirit in which he worked:—"There is scarcely any well-informed person who, if he has but the will, has not also the power to add something essential to the general stock of knowledge, if he will only observe regularly and methodically some particular class of facts which may most excite his attention or which his situation may best enable him to study with effect." And although as a general proposition one may reasonably demur to it as an overstatement, there can be no question that in his own particular case it was carried into effect with signal completeness.

When he took up the subject in 1832, the principal notion in registering plant-stations was to guide collectors to the places where they could gather the species. When he published the last volume of 'Topographical Botany' in 1874, the distribution of British plants from all possible points of view was so thoroughly searched out and placed on record that all that remains for his successors is to fill in a few small points of detail. His first work, 'Outlines of the Distribution of British Plants belonging to the division Vasculares,' is a small octavo of 334 pages, which was printed in Edinburgh in 1832 for private distribution. Under the title of 'Remarks on the Distribution of British Plants, chiefly in connection with Latitude, Elevation, and Climate,' what may be considered as another edition of the same work was published in London by Longmans in 1835. It was translated into German by Beilschmidt in 1837, and acknowledged by the German botanists by a diploma of membership from the Imperial L.-C. Academy 'Naturæ Curiosorum,' of which Nees von Esenbeck was at that time the president. In the same year (1835) Mr. Watson published the first volume of the 'New Botanist's Guide,' and the second followed in 1837. This is planned upon the lines of the 'Botanist's Guide' of Turner and Dillwyn, and enumerates the special localities of the rare plants of England and Scotland, taking them county by county. In 1843 he issued the first part of a much more elaborate work on the plan of the outlines. This was only carried out through the series of plants, following the Candollean sequence of orders, as far down as *Papaveraceæ;* when, the plan being found to be too cumbrous, the work was not carried on. The first volume of his *magnum opus*, 'Cybele Britannica,' appeared in 1847, and it was followed by volume ii. in 1849, volume iii. in 1852, and volume iv. in 1859. It was his own original idea to apply the term *Cybele* to a systematic treatise on the geography of the plants of any particular country, applying it as parallel to the term *Flora*, which has been used for a long time for a systematic description of the orders, genera, and species of any given tract. It is in the 'Cybele' that we have his plans for registering the details of plant-distribution brought out and used in their full development. These of course are so familiar to most of those who will read this notice that it seems almost a work of supererogation to explain them. To each individual species he applies, at it were, four different measuring scales, each adapted to register its distribution from a different point of view. To record its range of station he uses a series of adjectival terms, such as agrestal, paludal, glareal, sylvestral, &c. To register the horizontal distribution of the species he divides Britain into eighteen provinces, founded as far as possible on river-drainage. Yorkshire is the only county that claims a province to itself. The Peninsula province includes the three counties of Cornwall, Devonshire, and Somerset, and so on through the series. He traces the distribution of the species through these eighteen provinces by giving under each name a line of figures showing in which province that particular species grows, For fuller detail, to be used in local work, these provinces were afterwards subdivided

into 38 subprovinces and 112 counties or vice-counties. The vertical range of the species he registers by means of two regions of climate and altitude, each divided into three zones. The Agrarian region includes that part of Britain in which it is possible, so far as climate is concerned, to cultivate the cereal grasses and potatoes. It of course includes the whole area of the island at sea-level from north to south ; and the hills up to about 600 yards in the North of England, and 400 yards in the North of Scotland. All above this is mountain, heather, and rock, with a temperature like that of the low levels in Arctic latitudes. This upper region he called the Arctic region, and the zones Superarctic, Midarctic and Inferarctic, Superagrarian, Midagrarian and Inferagrian. The Inferagrarian zone, for instance, includes all the low-level country south of the estuaries of the Humber and the Mersey. He estimated that average annual temperature sinks at the rate of one degree Fahrenheit for every hundred yards of elevation, and that in Britain the range of mean annual temperature is from 52° to 34°, which makes a zone to be equal on an average to three degrees of Fahrenheit's scale. Then he deals with each species from a historical point of view, classifying them into Natives, Colonists, Denizens, and Aliens, according to whether they appear to have come into the country without man's help, or to have been introduced by human agency acting directly or indirectly. And finally he separates out the species into their types of distribution, British, English, Atlantic, Germanic, Scotch, or Highland, according to whether they preponderate in some particular part of the island or are dispersed, broadly speaking, through the whole of it. In a 'Supplement of the Cybele,' which came out in 1860, the horizontal range of the species is traced out through the thirty-eight subprovinces. In the three volumes of the 'Compendium' (1868–1870) a mass of additional information obtained after the publication of the 'Cybele' is incorporated, and the distribution of the species beyond the bounds of Britain worked out. And finally, in 'Topographical Botany,' 2 volumes, 1873–1874, the horizontal distribution of the species is traced through the 112 vice-counties. Altogether the earlier small octavos run on to about sixteen hundred pages, and the later volumes of larger size to four thousand pages ; these were printed entirely at his own expense and in most cases never offered for sale at all, but given away to the public scientific libraries and those correspondents who had helped him by sending catalogues or specimens, or who were known to him as being interested in the subject.

Cautious and unspeculative as he was to an extreme degree in his theoretical conclusions in scientific matters, there was one point bearing upon the evolution theory which attracted his attention from an early date, and on which he strongly advocated the views which are now generally current long before Darwin made them popular. At a time when all our leading systematists were dealing with species as if they possessed a clearly-marked and definitely separable individuality, their uncertainty and their inequality formed one of his favourite theses. An article on the

subject, which he wrote in the 'Phytologist' for 1845, will be found reprinted in 'Cybele,' vol. iv., p. 59, and a full statement of his views on this subject in 'Cybele,' vol. iv., pp. 35 to 52. At one time he was a copious contributor to the periodical journals which take Botany as a subject partially or wholly. His principal papers are to be found in Loudon's 'Magazine of Natural History,' in Sir Wm. Hooker's 'London Journal of Botany,' in the old series of the 'Phytologist,' which dates from 1841 to 1854, and in the earlier volumes of this Journal. In the 'Phytologist' he wrote not unfrequently reviews and anonymous notices, but in his case anonymity is a very thin veil. His last word in print was the letter to Mr. Newbould on the subject of the authorship of third edition of 'English Botany,' which appeared at page 80 of this Journal for March of the present year.

He was the main stay of the London Botanical Society, as Dr. J. E. Gray and Mr. G. E. Dennes have borne testimony in print. He did not join for some time after its commencement, but for several years he was the only good critical botanist amongst the resident London members, and all the parcels were sent down to Thames Ditton for him to supervise. When Dr. Boswell undertook the curatorship, this of course was no longer necessary. The 'London Catalogue of British Plants' is now in its seventh edition. The earlier editions were, I believe, almost entirely drawn up by Mr. Watson, whilst in the later ones he had Dr. Boswell's aid. The only excursion beyond the bounds of Britain which he ever undertook was a trip to the Azores in the summer of 1842. From their position far out in the Atlantic, about midway between Europe and America, the flora and fauna of these islands possess a peculiar interest. A surveying expedition was planned by the English Government, and the war steamer Styx detailed for the service, and notice was given to Sir Wm. Hooker that a botanist would be allowed a place on board if he would himself defray all the necessary expenses incident on his explorations. Sir William communicated with Mr. Watson, and he undertook the post on these conditions. Though much hampered in carrying out his plans by the martinet ways of the captain, and being able to visit only four out of the nine larger islands, he made a collection of 338 out of a total flora of under 500 species, about one hundred of which were not known in the group before, several of them being new to science. Through this visit he introduced into cultivation several of the more interesting endemic Azoric plants, such as *Campanuli Vidalii* and *Myosotis azorica*. When in 1870 Mr. Godman planned a complete natural history of the Archipelago, Mr. Watson wrote for him the botanical part of the work, which is not only valuable as a scientific production, but is in style eminently characteristic of its author.

During his early years, long before railway times, he made many excursions in different parts of Britain, especially for the purpose of tracing out the vertical range of plants in the mountainous districts, a subject to which very little attention had been previously paid. A great part of what is given in the 'Cybele'

under this head is the result of his own field-work. For the last thirty years of his life he travelled very little, and for many years before his death never spent a night away from his own house. For many years he sent regularly to the Botanical Society and Exchange Club a large supply of the rarer plants that came within the range of his daily excursions, selected and dried with characteristic care. His own British herbarium is a large one, and possesses a special relation to the 'Cybele,' as he laid in the specimens mainly to exhibit not so much the characters as the geographical range of the species. When 'Topographical Botany' was finished, he entertained at one time the notion of making a '*Nunc dimittis*' bonfire of his herbarium, but we all of us, from Sir Joseph Hooker and M. Alphonse DeCandolle downward, protested energetically against the carrying out of the idea, and it was finally settled that on his death it should be offered to Kew. One of the special instructions which he has given to me, as his executor, is that upon his death all his botanical manuscripts were to be burnt. At one time he gathered together and cultivated a large number of the rarer and more critical British plants, and to the end his garden was to him a great source of pleasure and interest. A biographical notice would certainly be very incomplete which did not take count of his merits as a writer of letters. His letters were always thought out carefully, and so full of matter so pithily expressed that, as one who is peculiarly well qualified to judge remarked at his funeral, a selection from them would be worth publishing on literary grounds alone.

Next to Botany, the subject that most engaged his attention was Phrenology. Whilst studying at Edinburgh he made the acquaintance of George Combe (whose estimate of his character and capabilities I have already cited), and, through him, of his brother Andrew and Dr. Spurzheim. This is not the place to attempt an appreciation of his work in this field, and I am not in the least qualified to deal with the subject. He always maintained that Phrenology rested on a sound scientific basis. His two phrenological works are 'Statistics of Phrenology, being an account of the progress and present state of that science in the British isles,' published in 1836, and a controversial pamphlet in reply to an attack by Mr. Scott on Combe's 'Constitution of Man.' He edited the 'Phrenological Journal' from 1830 to 1840, and wrote various articles in it at other times. His reason for giving up the editorship, as stated in 'Men of the Time,' is so characteristic, that I cannot forbear citing it.

"For some years he edited the 'Phrenological Journal,' but eventually withdrew from it, on finding that grave offence was given to more zealous advocates of that study, through his too freely pointing out the imperfect character of its evidences and definitions, and the need of more exact investigations."

In early life he devoted a good deal of attention to Entomology, and made a collection of upwards of a thousand British and eight hundred exotic species of insects. As he gradually settled down to Geographical Botany, he gave up insect collecting, and in 1834

sent the collection to Sir J. D. Hooker, who was thirteen or fourteen years his junior. It is interesting to notice that our leading botanists of the present time, Sir Joseph Hooker, Professor Babington, Dr. Boswell, and Mr. Watson, were all ardent entomologists before they finally settled down to Botany.

He was a man of great individuality and of many-sided character, and I have often been amused to note how differently different people estimated him, according to the parts of his disposition with which they had been brought in contact. From a scientific point of view, he finished the task which in early life he set himself to accomplish with admirable perspicacity and completeness. When M. Alphonse DeCandolle lately made out a list of botanical epochs, he counted the publication of the 'Cybele' as one of them, But in some ways it was not the best part of his disposition that his published writings show. With him botanical geography is not simply a gathering together of statistics, and a working out of impersonal theoretical conclusions. His fondness for character-analysis led him so readily from plants to people that he did not always remember how it might pain a man to see his little weakness and shortcomings pilloried in print. He loved an argument like a man who can ride well loves a gallop on a spirited horse. He was accurate and clear-headed to a wonderful degree; he had a splendid memory, he was unimaginative, and never worked in a hurry; and all this made him impatient of other people's bungling and blundering. He was a pioneer, and in making a firm macadamised road he had much rubbish to shovel away. He was a man of warm temper and strong prejudices; and if he once got a notion that a man was radically careless or conceited, he did not spare to slash at him in print whenever his name turned up. One of his pet prejudices was an objection to new names for plants, and the name-givers were a favourite target for his arrows. And thus it comes that those old papers in the 'Phytologist' and the tail-paragraphs in the geographical books are often full of lively personal interest. "Ah!" he said more than once during the latter years of his life, as we talked over these things on the quiet Sunday afternoons, "they read too bitter. You don't know what it is to have a large organ of destructiveness."

But this same slashing critic was in some ways almost morbidly self-distrustful and considerate of other people's feelings. Although he wrote so much, he never seemed to like that his books should be sold; and so several of them never found their way into the hands of the booksellers at all, but he gave all the copies away, and never recouped himself one penny of the cost of paper, print, and binding. He had a scruple against ever inviting anyone to pay him a visit, lest they should be bored; and sometimes when a botanist of a younger generation, who was all the while looking up to him as a great master in science, would venture to call uninvited, he would, after devoting several hours of his time to instructing and entertaining him, thank him on parting for the visit, in a way to which it was very difficult on the spur of

the moment to make any suitable response, because it was so unexpected. The encouragement and help which he gave to many young beginners in Botany is remembered by them with feelings of gratitude and affection. On this point I can myself insist with emphasis, for when I left school and became immersed in business engagements, and was surrounded by friends and relations who knew and cared nothing about Botany, I should probably have drifted away from it altogether if I had not made his acquaintance. In answering letters, in helping his correspondents to name critical plants and fill up gaps in their herbaria, in referring back to his notes and catalogues (as he was asked to do so often in his latter years), to explain the details on the faith of which he had stated some record in general terms, his patience and assiduity were unbounded, and no one but those who lived with him knew what a large proportion of his time was often occupied in this way. In helping by money to the full extent of his pecuniary means, and by judicious counsel, such of his friends and acquaintance as fell into illness and misfortune, his liberality was very great. Such traits as these can, from the nature of the case, live only in the memory of one here and another there who knew him by personal contact.

His funeral took place at the rustic church of the village with which he has been so long identified, on the afternoon of Wednesday, August 3rd. The closed shutters of the village shops testified to the respect in which he was held by his neighbours, and, in addition to his relatives, the following botanists resident in London and the neighbourhood were present:—Sir J. D. Hooker, the Hon. J. L. Warren, the Rev. W. W. Newbould, Prof. Lawson, Messrs. Baker, Blow, Boulger, Britten, Dyer, H. Groves, and B. D. Jackson.

A SYNOPSIS OF THE GENUS *PITCAIRNIA*.

By J. G. Baker, F.R.S.

(Continued from p. 233.)

19. P. furfuracea, Jacq. Eclog. 117, t. 79; Sims in Bot. Mag. t. 2657.—*P. ramosa*, Jacq. Eclog. 154.—Leaves linear, about 2 ft. long, about an inch broad, acuminate, not distinctly petioled, green and naked on the face, white-furfuraceous on the back, spiny towards the base. Peduncle 2–3 ft. long, including the inflorescence. Racemes 3–5, rather dense, the end one about a foot long; axis stout and floccose; pedicels ascending, $\frac{1}{4}$–$\frac{1}{3}$ in. long; bracts lanceolate, as long as the pedicels. Sepals lanceolate, $\frac{3}{4}$–$\frac{7}{8}$ in. long. Petals 2–2$\frac{1}{4}$ in. long, bright red, scaled at the base. Stamens and style not protruded.—Known to me only as a garden plant, and doubtfully distinct specifically from *P. latifolia*.

20. P. albucæfolia, Schrad. Comment. Blumenb. 24, t. 3.—*P. affinis*, K. Koch, Mon. 5.—Leaves linear, 1$\frac{1}{2}$–2 ft. long, an inch broad at the middle, acuminate, not distinctly petioled, green and

naked on the face, white-furfuraceous on the back, spine-margined towards the base. Peduncle 2 ft. or more long, with many erect leaves. Raceme dense, always simple, 3–9 in. long; axis slightly cottony; pedicels ascending, the lower $\frac{3}{8}$–$\frac{1}{2}$ in. long; bracts lanceolate, often twice as long as the pedicels. Sepals lanceolate, $\frac{3}{4}$–$\frac{7}{8}$ in. long. Petals bright red, twice as long as the sepals, scaled at the base. Stamens and style not exserted.—Martinique, *Hahn*, 355! 582! 879! 1052! Venezuela, *Cruger!* Differs from *latifolia* by its simple dense racemes and large bracts; so that it is midway between *latifolia* and *bracteata*.

21. P. BRACTEATA, Dryand. in Ait. Hort. Kew. edit. 2, ii. 202; Hook. in Bot. Mag. t. 2813.—*P. latifolia*, Red. Lil. t. 74, non Ait.—*P. Gireoudiana*, Dietr. in Allgem. Gartenzeit. xxi. 105.—*P. commutata*, Regel Gartenfl. 1867, 289, t. 557.—Leaves in a dense tuft, linear, $1\frac{1}{2}$–2 ft. long, $\frac{3}{4}$–1 in. broad, acuminate, not petioled, moderately firm in texture, entire or slightly prickly towards the base, green and naked on the face, white-furfuraceous on the back. Peduncle a foot long, stout, floccose, with numerous reduced leaves. Raceme simple, dense, $\frac{1}{2}$–1 ft. long, 3–4 in. diam.; pedicels erecto-patent, the lower only $\frac{1}{4}$ in. long; axis cottony; bracts lanceolate, the lower 1–$1\frac{1}{2}$ in. long, the upper shorter. Sepals lanceolate, $\frac{3}{4}$–1 in. long. Petals in the type bright red, decurving, subsecund, twice as long as the sepals, scaled at the base. Stamens and style as long as the sepals.—St. Vincents, *Anderson! Guilding!*—*P. sulphurea*, Andrews Bot. Rep. t. 249, is a variety with yellow flowers. Both varieties have long been known in cultivation.

22. P. ALTA, Hasskarl Retzia, ii, 5.—*P. ramosa*, K. Koch Monogr. 5, non. Jacq.—Acaulescent, densely cæspitose. Leaves 12–20 to a stem, linear, 2–3 ft. long, $\frac{3}{4}$–1 in. broad at the middle, very acuminate, narrowed to $\frac{1}{4}$ in. above the dilated base but not distinctly petioled, spine-edged towards the base, green and naked on the face, white-furfuraceous on the back. Peduncle 2–3 ft. long below the inflorescence, floccose, with many reduced leaves. Racemes several, arranged in a deltoid panicle about 2 ft. long and broad, the lower branches compound; racemes lax; lower pedicels $\frac{1}{3}$–$\frac{1}{2}$ in. long, ascending or spreading; bracts lanceolate, not longer than the pedicels. Sepals bright red, lanceolate, $\frac{3}{4}$–$\frac{7}{8}$ in. long. Petals bright red, 2. in. long, $\frac{1}{4}$ in. broad, minutely scaled at the base. Stamens and style reaching to the tip of the petals.—Dominica, *Imray!* This is in cultivation under various names, amongst which are *bromeliæfolia*, *intermedia*, and *Skinneri*. My description is mainly taken from a plant that flowered at Kew in August, 1877. Mr. Bull had it in flower in October, 1878.

23. P. CONSIMILIS, Baker.—Very like *P. ferruginea*, but much smaller in all its parts. Leaves linear, sessile, $\frac{1}{2}$ ft. long, $\frac{1}{2}$ in. broad at the base, firm in texture, very acuminate, channelled down the glabrous face, white-furfuraceous on the back, prickle-margined all the way up. Peduncle glabrescent, a foot long below the inflorescence, all its leaves bract-like. Racemes 3–6, very lax, arranged in an ample panicle, the end one a foot long; pedicels ascending, $\frac{1}{2}$–$\frac{3}{4}$ in. long; bracts oblong-lanceolate, scariose, densely

ferrugineo-pubescent on the back, the lower as long as the pedicels, the upper half as long. Sepals lanceolate, glabrescent, about an inch long. Petals whitish, spirally twisted after expansion, more than twice as long as the sepals. Stamens and style included.—Andes of Bolivia, temperate and subalpine zones, alt. 8500–12,000 feet, *Mandon*, 1173!

24. P. JACKSONI, Hook. in Bot. Mag. t. 4540.—*Lamproconus Jacksoni*, Lemaire, Jard. Fleur. t. 127.—Acaulescent. Leaves in a dense tuft, linear, a foot or more long, $\frac{1}{2}$–$\frac{3}{4}$ in. broad at the middle, narrowed to $\frac{1}{4}$ in. above the dilated base, not petioled, spine-serrated in the upper half, green and naked on the face, white-furfuraceous on the back. Peduncle short. Raceme lax, simple, 8–9 in. long; rachis floccose; lower pedicels $\frac{1}{2}$–$\frac{3}{4}$ in. long; bracts lanceolate, not more than half as long as the pedicels. Sepals lanceolate, $\frac{1}{2}$–$\frac{5}{8}$ in. long. Petals bright red, three times as long as the sepals, scaled at the base. Stamens reaching to the tip of the petals. Stigma finally exserted.—Guatemala, imported by Jackson, of Kingston, about 1850.

25. P. SUBPETIOLATA, Baker.—Acaulescent. Leaves with a channelled petiole a foot long, spine-edged at the dilated base, with an entire linear lamina 2–3 ft. long, $\frac{1}{2}$ in. broad at the middle, narrowed very gradually to both ends, green and naked on the face, white-furfuraceous on the back. Peduncle above 3 ft. long, with many reduced leaves. Raceme simple, very lax, a foot long; pedicels erecto-patent, the lower $\frac{1}{2}$–$\frac{3}{4}$ in. long; rachis slightly floccose; bracts lanceolate, not more than half as long as the pedicels. Sepals lanceolate, glabrescent, $\frac{3}{4}$–1 in. long. Petals red, scarcely twice as long as the sepals.—Eastern Peru, near Tarapoto, *Spruce* (not distributed with any number); and a form with leaves twice as broad and shorter, from San Carlos, in the Amazon Valley, *Spruce*, 3054!

26. P. BROMELIÆFOLIA, L'Herit. Sert. 7, t. 11; Swartz Fl. Ind. Occ. 1971, t. 12; Bot. Mag. t. 834; Red. Lil. t. 75; Lindl. in Bot. Reg. t. 1011.—Acaulescent. Leaves in a dense tuft, linear, 2–3 ft. long, $\frac{1}{2}$–$\frac{3}{4}$ in. broad at the middle, acuminate, not distinctly petioled, spine-edged towards the base, green and glabrous on the face, white-furfuraceous on the back. Peduncle about a foot long below the inflorescence, furnished with several long leaves. Racemes simple or slightly compound, reaching a foot in length, lax, with a slightly-floccose rachis; lower pedicels $\frac{3}{4}$–1 in. long, spreading or ascending; bracts lanceolate, shorter than the pedicels. Sepals lanceolate, glabrescent, bright red, $\frac{3}{4}$–$\frac{7}{8}$ in. long. Petals bright red, about 2 in. long, scaled at the base. Stamens and style as long as the petals.—Jamaica, *Wright! Bancroft! Purdie!* and a nearly-allied plant with shorter sepals from Tarapoto, in Eastern Peru, *Spruce*. This is the oldest-known species. There is a specimen in the Smithian herbarium from the younger Linnæus, and one at the British Museum from Chelsea Gardens in 1787.

Judging from the description *P. platyphylla*, Schrad., is a robust broad-leaved variety of this species.

27. P. FIRMA, Baker.—Leaves linear, very firm and rigid in texture for the genus, 1–1½ ft. long, ¼–⅜ in. broad, sessile, acuminate, the margin armed throughout with distant ascending stramineous spines ⅛–⅙ in. long, the upper surface bright green, the lower paler, but not furfuraceous. Peduncle 1½–2 ft. long, subglabrous, all its leaves small. Raceme lax, simple, 6–9 in. long; rachis nearly naked; pedicels ascending, the lower ¼–⅓ in. long; bracts lanceolate, ⅛–¼ in. Sepals lanceolate, naked, ⅝–¾ in. Petals bright red, lingulate, 2 in. long. Genitalia included.—Known to me only from a garden specimen in K. Koch's collection, where it was labelled *P. Jacksoni*.

28. P. CORCOVADENSIS, Wawra Bot. Ergeb. 160, t. 27.—Acaulescent. Rudimentary leaves deltoid, unprickly. Produced leaves about half a dozen, with a petiole ½ ft. long and a linear lamina 2–3 ft. long, ¾–⅞ in. broad at the middle, thin in texture, tapering to both ends, green on both sides, entirely free from prickles down to the base. Peduncle slender, leafy, 1–1½ ft. long. Raceme lax, simple; lower pedicels ½–¾ in. long; bracts lanceolate, longer than the pedicels. Sepals naked, lanceolate, reddish, ¾–⅜ in. long. Petals bright red, 2½ in. long, scaled at the base. Stamens nearly as long as the petals. Style exserted.—South Brazil, near Rio Janeiro, *Wawra*, 3; *Glaziou*, 12237!

29. P. CINNABARINA, A. Dietr. in Allgem. Gartenzeit. xviii. 202.—Acaulescent. Produced leaves linear, sessile, 1½ ft. long, ⅝–¾ in. broad at middle, quite without spines down the base, green on both sides, with only a few scattered brown lepidote spots beneath. Peduncle a foot long, naked, with several reduced lanceolate leaves. Racemes dense, simple, about ½ ft. long; rachis dotted with lepidote scales, but not at all floccose; pedicels ascending, the lower ¾–1 in. long; bracts lanceolate-acuminate, as long as the pedicels. Sepals lanceolate, naked, ¾–⅞ in. long. Petals bright red, lingulate, 2 in. long, not scaled at the base. Stamens as long as the petals. Style a little exserted.—Brazil. Of this I have only seen cultivated specimens.

30. P. KAREWINSKIANA, Schultes fil. Syst. vii. 1239.—*P. ringens*, Klotzsch in Link, Klotzsch et Otto Ic. Rar. Berol. 63, t. 23; Regel Gartenflora, t. 53.—*P. splendens*, Warcz. in Otto et Dietr. Allgem. Gartenzeit. xix. 176.—*P. Warcewicziana*, *montalbensis* et *fulgens*, Hort.—Acaulescent. Produced leaves linear, 1½–2 ft. long, ½–¾ in. broad, acuminate, distinctly petioled, green on both sides, moderately firm in texture, usually without prickles. Peduncle 1–2 ft. long, slightly floccose, with many reduced leaves. Raceme dense, simple, about ½ ft. long; rachis slightly floccose; pedicels ascending, lower ¼–½ in. long; bracts lanceolate, twice as long as the pedicels. Sepals lanceolate, naked, reddish, ¾ in. long. Petals lingulate, secund, bright red, 2½ in. long, not scaled at the base. Stamens as long as the petals. Style finally exserted.—Mexico, *Karwinski, Hinck!* Well known in cultivation. My description is taken from a plant that flowered with Messrs. Veitch in June, 1877. A plant, gathered by Botteri in the province of Orizaba (No. 911), differs from the type by its broader leaves, densely cottony raceme, rachis and pedicels, and larger sepals.

31. P. SPATHACEA, Griseb. Symb. Fl. Argent, ii. (1878), 329.—Leaves linear, 2–3 ft. long, an inch broad, spine-edged at the base only, slightly furfuraceous on the upper surface, glabrescent beneath. Racemes several, arranged in a lax panicle, 6–8 in. long; pedicels very short; bracts lanceolate, reaching about half-way up the flowers. Sepals lanceolate, very acuminate, an inch long. Petals ¼ in. longer than the calyx, not scaled at the base.—Argentine Territory, on the banks of the Rio Janeiro, *Lorentz*.

32. P. LECHLERI, Baker.—Whole plant about 4 ft. high. Outer unproduced leaves with a long pectinate rigid tip, as in *P. heterophylla* and *pungens*. Produced leaves linear, entire, not petioled, moderately firm in texture, green and glabrous on both surfaces, 1½–2 ft. long, ¾–1 in. broad at the middle, narrowed to both ends. Peduncle about 2 ft. long, all its leaves much reduced, the lower spine-edged. Racemes several, arranged in a lax panicle; end one dense in the upper half, 8–10 in. long; rachis not at all floccose; pedicels very short; bracts lanceolate, the lower ¾–1 in. long. Sepals lanceolate, glabrous, ½ in. long. Petals bright red, half as long again as the sepals. Stamens and style included.—Eastern declivity of the Peruvian Cordilleras at Sachaporta, *Leehler*, 3132!

33. P. CONCOLOR, Baker.—Acaulescent. Outer unproduced leaves with a rigid pectinate narrow linear tip. Produced leaves linear, above 1 ft. long, ¾–1 in. broad, tapering from the middle to the apex and more gradually to the base, without teeth, not petioled, green and glabrous on both surfaces. Peduncle about 1 ft. long, floccose, all its leaves small and bract-like. Raceme lax, simple, 3–6 in. long; rachis densely floccose; pedicels ascending, the lower ¼–⅓ in. long; bracts lanceolate, cottony, the lower ¾–1 in. long. Sepals lanceolate, acuminate, floccose, 1 in. long; petals bright red, twice as long as the sepals. Stamens and style included.—Canta, Peru, *Maclean!*

34. P. NUDA, Baker.—Acaulescent. Leaves not seen fully developed, linear, acuminate, spine-edged in the lower part, green and glabrous on both surfaces. Peduncle 1 ft. or more long, glabrous, its leaves much reduced and spine-margined. Racemes in a deltoid panicle 2 ft. long, with erecto-patent branches, very long; axis slender, naked; pedicels drooping, ¾–1 in. long; bracts minute, lanceolate. Sepals lanceolate, acuminate, glabrous, 1½ in. long, twisting together when the flower fades. Petals bright red, not more ½ in. longer than the sepals. Stamens included. Stigma exserted. Seeds minute, wedge-shaped, with a broad white horny border surrounding the nucleus on all sides but one, not tailed at either end.—British Guiana, on the banks of the Rapammi, *Appun*, 1582.

35. P. SUAVEOLENS, Lindl. in Bot. Reg. t. 1069.—Acaulescent. Produced leaves linear, 1½ ft. long, ½–¾ in. broad at the middle, acuminate, not petioled, entirely without prickles, green and glabrous on both surfaces. Peduncle above 1 ft. long, naked, with many much-reduced leaves. Raceme 6–8 in. long, simple, moderately dense; rachis glabrous, pedicels ascending, ¼–½ in. long; bracts lanceolate, naked, the lower 1–1½ in. long. Sepals lanceolate,

glabrous, 1 in. long. Petals twice as long as the sepals, lingulate, subsecund, whitish, scaled at the base. Stamens included. Stigma finally exserted.—Organ Mountains, South Brazil, *Gardner*, 5895 ! Introduced into cultivation in 1826. I cannot, from the description, separate *P. micrantha*, Lindl. in Bot. Reg. xxix., Misc. 44, imported from Rio by Sir Chas. Lemon, of Carclen, in 1841. This may be *Tillandsia lævis*, Vellozo. Flum. iii. t. 126, = *Pitcairnia lævis*, Beer. Brom. 60.

36. P. ALBIFLOS, Herb. in Bot. Mag. t. 2642.—*Cochliopetalum albiflos*, Beer Brom. 68.—*P. odorata*, Regel Gartenfl. 1855, 46, t. 114.—*Tillandsia Schuchii*, Fenzl. in Otto et Dietr. Allgem. Gartenzeit. xiv. 266.—*Cochliopetalum Schuchii*, Beer Brom. 69.—Leaves many to a tuft, linear, 1½–2 ft. long, ½–¾ in. broad at the middle, obscurely petioled, without any prickles, green and glabrous on both surfaces, acuminate. Peduncle 1–2 ft. long, its lower leaves long, its upper short and bract-like. Raceme simple, lax, ½–1 ft. long; rachis slightly pilose; pedicels spreading, the lower 1 in. long; bracts lanceolate, shorter than the pedicels. Sepals lanceolate, glabrous, ¾ in. long. Petals white, three times as long as the sepals, scaled at the base, revolute at the tip after expansion. Stamens as long as the petals. Stigma exserted.—Rio Janeiro, *Glaziou* 8022 ! 8023 ! Introduced into cultivation about 1826. So far as the description goes *P. elata*, Liebm. Ind. Sem. Hort. Hafn. 1849, 14, agrees with this, but it is said to come from East Mexico.

37. P. ANDREANA, Linden. Cat. 1873; Ill. Hort. n. s. t. 139, Baker in Bot. Mag. t. 6480.—*P. lepidota*, Regel in Act. Hort. Petrop. ii. 435.—Whole plant under 1 ft. high. Produced leaves four or five to a stem, lanceolate, not distinctly petioled, 16–20 in. long, 1–1½ in. broad at the middle, narrowed to ⅓ in. above the base and to a long point, white all over beneath and scattered over with lepidote scales on the upper surface. Peduncle densely leafy, 4–6 in. long. Raceme simple, 4–6 in. long; pedicels ascending, the lower ¼–⅓ in. long; bracts very small. Sepals green, lanceolate, ¾ in. long, lepidote on the back. Petals one-sided, lingulate, 2½–2¾ in. long, yellow at the tip, red lower down. Stamens and stigma reaching to the top of the petals.—New Granada and Venezuela. Introduced into cultivation by Roezl about ten years ago. My description is taken from a specimen that flowered at Kew in July, 1879, sent by Dr. Regel.

38. P. PRUINOSA, H. B. K. Nov. Gen. i. 295.—Produced leaves lanceolate, 1½–2 ft. long, 1–1½ in. broad, acuminate, spine-edged towards the base, green and glabrous on the face when mature, furfuraceous beneath. Peduncle 2 ft. long, copiously leafy. Racemes lax, simple or sparingly compound; axis slightly pilose; pedicels ascending, pilose, ¼–½ in. long; bracts lanceolate, mostly shorter than the pedicels. Sepals red-tinted, glabrescent, lanceolate, ¾–⅞ in. long. Petals bright red, scaled at the base, 2 in. long. Genitalia included.—Venezuela, on the banks of the Orinoco, *Humboldt*. La Guayra, *Moritz*, 1232 ! A near ally of *P. latifolia*.

39. P. FULGENS, Decne in Otto et Dietr. Allgem. Gartenzeit.

xix. 26.—*P. Decaisnei*, K. Koch Monogr. 5.—Acaulescent. Outer rudimentary leaves pectinate. Produced leaves as many as twenty to a tuft, ensiform, 2–3 ft. long, 1–1½ in. broad at the middle, obscurely petioled, erectly falcate, very acuminate, green and glabrous on the face, white and distinctly lineate all over the back, margined with small green ascending prickles all the way up and larger black ones towards the base. Peduncle 3 ft. long below the inflorescence, copiously leafy. Racemes several, very lax, 3–6 in. long, forming a deltoid panicle; pedicels ascending, ¼–½ in. long; bracts minute, lanceolate; rachises bright red, nearly or quite naked. Sepals bright red, lanceolate, glabrous, ¾–⅞ in. long; petals bright red, 2–2¼ in. long, with a large truncate scale at the base. Stamens and stigma not protruded.—Brazil. A fine plant, well-known in cultivation. We had it at Kew as long ago as 1858, but I have not been able to meet with wild examples.

40. P. Olfersii, Link in Verhand. d. Ver. z. Bef. d. Gartenb. vii. 363, t. 3.—*P. L'Herminieri*, Hort.—Acaulescent. Produced leaves ensiform, distinctly petioled, 2–3 feet long, 12–16 lines broad at the middle, acuminate, green and naked on the face, white-furfuraceous on the back, neither lamina nor petiole spine-edged. Peduncle 2–3 ft. long, its lower leaves long, its upper much reduced and bract-like. Raceme simple, rather dense, reaching a foot long; rachis naked; pedicels ascending, ½–1 in. long; bracts lanceolate, as long as or longer than the pedicels. Sepals lanceolate, glabrous, an inch long. Petals bright red, lingulate, 2–2½ in. long, scaled at the base. Stamens and style about as long as the petals.—Rio Janeiro, *Glaziou*, 8021!

41. P. flammea, Lindl. in Bot. Reg. t. 1092.—Acaulescent. Produced leaves ensiform, 2–2½ ft. long, 1–1¼ in. broad at the middle, not distinctly petioled, acuminate, green and glabrous on the face, persistently white-furfuraceous on the back, not at all spine-margined. Peduncle 1–1½ ft. long, bright red, copiously leafy. Raceme rather dense, simple, ½–1 ft. long; rachis thinly pilose; pedicels ascending, ¼–½ in. long; bracts lanceolate, twice as long as the pedicels. Sepals red, lanceolate, glabrous, ¾–⅞ in. long. Petals bright red, more than twice as long as the sepals, scaled at the base. Stamens and stigma not protruded.—Brazil, on rocks of the Organ Mountains, *Gardner*, 5896! Introduced into cultivation about 1826. I expect it will prove to be conspecific with *P. Olfersii*.

42. P. pulverulenta, Ruiz et Pavon Fl. Peruv. iii. 36, t. 259. —*P. paniculata*, R. & P. Fl. Peruv. t. 260.—*P. longifolia*, Hook. in Bot. Mag. t. 4775.—*P. excelsa*, E. Morren in Belg. Hort., 1875, 381.—Whole plant 6–12 ft. high. Produced leaves ensiform, 3–4 ft. long, 1½–2 in. broad at the middle, narrowed to an acuminate point and ½ in. above the dilated base, spine-margined towards the base, green and glabrous on the upper surface, white-furfuraceous beneath. Peduncle elongated, with several leaves. Racemes many, arranged in a lax deltoid panicle, lax, ½–1 ft. long; rachises floccose; pedicels ¼–½ in. long; bracts minute, lanceolate. Sepals lanceolate, floccose, ¾ in. long. Petals bright

red, about 2 in. long, scaled at the base. Genitalia not exserted. —Andes of Peru, *Pavon! Matthews*, 2089! 3132! Introduced into cultivation by Nation about 1850, and again by Roezl.

43. P. CORALLINA, Linden et André; Carriere in Rev. Hort., 1875, 251, cum icone.—Produced leaves lanceolate, distinctly petioled, 4–5 ft. long, 3½–4½ in. broad, spine-edged low down, plicate like those of a *Curculigo*, green and glabrous on the face, white-furfuraceous on the back. Peduncle bright red, 1 ft. long, deflexed, all the leaves much reduced. Racemes dense, simple, deflected, above a foot long. Pedicels ⅓–½ in. long; bracts lanceolate, ¾–1 in. long. Sepals lanceolate, naked, bright red, above an inch long. Petals bright red, lingulate, 3 in. long, scaled at the base, edged with white. Style and stamens reaching to the tip of the petals.—Choco, New Granada. Introduced by Linden about 1874. A very fine and distinct species, well marked by its broad plicate leaves. It has flowered with Sir G. Maclean, at Pendell Court, this spring.

44. P. ECHINATA, Hook. in Bot. Mag. t. 5709; Lemaire Jard. Fleur. t. 407; Flore des Serres, t. 844.—Whole plant 5–6 ft. high. Outer unproduced leaves deltoid, not prickle-edged. Produced leaves 12–20 to a stem, lanceolate, 3–4 ft. long, 1–2 in. broad at the middle, obscurely petioled, bright green on the face, white-furfuraccous on the back, margined all the way up with minute prickles. Peduncle 2–4 ft. long below the inflorescence, mealy, with 8–10 leaves, the lower a foot long. Racemes several, very lax, arranged in an ample deltoid panicle; rachises slightly floccose; pedicels glandular, ½–1 in. long; bracts lanceolate, shorter than the pedicels. Sepals lanceolate, densely glandular, 15–18 lines long. Petals whitish, nearly twice as long as the sepals. Stamens and stigma included.—New Granada, *Goudot! Holton!* Stated in Bot. Mag. to be also received from Mexico.

45. P. XANTHOCALYX, Mart. Ind. Sem. Hort. Monac. 1848, Adn. 4.—*P. flavescens*, Baker in Bot. Mag. t. 6318.—*Cochliopetalum flavescens*, Beer Brom. 69.—Produced leaves up to 20 to a stem, lanceolate, 2–3 ft. long, 1–1½ in. broad at the middle, obscurely petioled, quite free from prickles, green and glabrous on the face, white-furfuraceous on the back. Peduncle 1½–2 ft. long, thinly pruinose, the lower leaves ½–1 ft. long. Raceme simple, lax in the lower half, 1–1½ or even 2 ft. long; axis thinly floccose; pedicels ascending, the lower ½–¾ in. long; bracts lancelolate, longer than the pedicels. Sepals lanceolate, ¾ in. long. Petals lingulate, primrose-yellow, 2 in. long. Stamens as long as the petals. Style finally a little exserted.—Brazil. This flowered at Kew in the summer of 1877. I find from Dr. Karl Koch's specimen that our *flavescens* is quite identical with the Munich *xanthocalyx*. The nearest resemblance to the plant is *P. bracteata* var. *sulphurea*.

46. P. AUSTRALIS, K. Koch Ind. Sem. Berol, 1857, 8.—*P. rubicunda*, K. Koch Mon. 8.—*P. Moreliana*, Hort.—Acaulescent. Stem bulbiform at the base. Outer unproduced leaves deltoid, brown-black, not prickle-edged. Produced leaves about half a dozen to a tuft, ensiform, 1½–2 ft. long, 1–1¼ in. broad at the middle,

narrowed to ½ in. above the dilated base, not petioled, not at all prickly, green and quite glabrous on both surfaces. Peduncle 1–1½ ft. long, glabrous, the lower leaves ½–1 ft. long, the upper small and bract-like. Raceme simple, lax, erect, 6–9 in. long; rachis glabrous; pedicels ascending, bright red, the lower ½ in. long; bracts lanceolate, much longer than the pedicels. Sepals lanceolate, naked, bright red, ¾–1 in. long. Petals bright red, 2 in. long. Genitalia just exserted.—Rio Janeiro, *Glaziou*, 12238! Minas Geraes, *Claussen!*

47. P. NUBIGENA, Planch. in Flore des Serres, t. 847.—Acaulescent, cæspitose. Produced leaves ensiform, petioled, an inch broad, narrowed to both ends, entire, bright green on both surfaces. Peduncle leafy, 1–1½ ft. long. Raceme simple, moderately dense, 6–8 in. long; pedicels ascending, the lower ½–¾ in. long; bracts lanceolate, as long as the pedicels. Sepals lanceolate, red, glabrous, 1–1¼ in. long. Petals bright red, scaled at the base, more than twice as long as the sepals. Stamens and style shorter than the petals.—Venezuela, amongst the mountains of Merida, alt. 8000–9000 ft., *Funck & Schlim.*

48. P. LEHMANNI, Baker.—Produced leaves ensiform, 2–3 ft. long, above an inch broad at the middle, green and naked on both surfaces, copiously spiny towards the base. Racemes dense, panicled; pedicels ascending, the lower ¼–⅓ in. long; bracts lanceolate, shorter than the pedicels. Sepals lanceolate, glabrous, ¼–⅝ in. long. Petals bright red, 18–21 lines long. Stamens and style as long as the petals.—Southern New Granada, near Pasto, *Lehmann!* A plant received lately from Dr. H. G. Reichenbach.

49. P. KALBREYERI, Baker.—Produced leaves with an acuminate lanceolate lamina 2–3 ft. long, 2½–3 in. broad at the middle, entire, narrowed moderately to the base, green and naked on both surfaces, and a distinct petiole 6–8 in. long, with a few squarrose prickles near its base. Peduncle 3–4 ft. long, slightly furfuraceous, its leaves distant and much reduced. Raceme very lax, simple, a foot long; lower pedicels ¼–⅓ in. long; bracts lanceolate, ⅜–½ in. long. Sepals lanceolate, glabrous, ¾–⅞ in. long. Petals red, above 2 in. long. Stamens and style just exserted.—New Granada, in the mountains of Ocana, 4500–5000 ft., *Kalbreyer*, 1103.

50. P. ORGYALIS, Baker.—Whole plant 6 ft. high. Produced leaves ensiform, 2–3 ft. long, 18–20 lines broad at the middle, not distinctly petioled, more firm in texture than is usual in the genus, green and naked on both surfaces, free from prickles. Racemes copiously panicled, moderately dense; rachises glabrous; lower pedicels ¼–⅓ in. long; bracts minute, lanceolate. Sepals lanceolate, glabrous, ½–⅝ in. long. Petals bright red, an inch longer than the sepals. Genitalia included.—Montana de Canelos, Andes of Ecuador, *Spruce*, 5399!

(To be continued.)

ON A NEW *ARALIACEA* OF UNCERTAIN ORIGIN.

By H. F. Hance, Ph.D., &c.

Some thirty and odd years ago a West of England journalist, in chronic warfare with an energetic prelate, emphatically one of the church militant, wrote of his adversary that, "though always in hot water, he never came out of it any the cleaner." There is perhaps no order of flowering plants which has within a comparatively recent period been more frequently examined than that of *Araliaceæ*; but it must be admitted that the polishings and brushings-up to which it has successively been subjected have not resulted in reducing it to such a respectable condition as its manipulators might have hoped for. It has been taken in hand, either partially or wholly, by Planchon and Decaisne, Seemann, C. Koch, Miquel, Bentham, and Baillon; but I am afraid the late Mr. Latimer's dictum will apply to its present state quite as fully as it did to his ecclesiastical antagonist. And this is owing to the fact that it seems well nigh impossible to form clearly defined groups in it. Almost every newly discovered species has something or other peculiar* which, in the eyes of many botanists, entitles it to generic rank; and, on the other hand, those systematists who hold to synthetic views are puzzled how to fix the limits of genera, so as to include plants differing in a variety of minor points of floral structure, and often very widely in habit. With few exceptions, indeed,—of which *Heptapleurum* and *Oreopanax* may perhaps be taken as the best examples,—most of the genera which have been proposed consist of groups of species disagreeing in a number of characters; and hence those who, like Seemann and Miquel, were inclined to multiply genera, did not fail to avail themselves of this fact in dealing with *Araliaceæ*. Bentham, with his usual acumen and philosophical insight, steadily discountenanced this tendency; but he himself expressed his dissatisfaction with the scheme he had elaborated,† and Baillon has since greatly cut down the number of genera, and also reduced *Araliaceæ* to a tribe of *Apiaceæ*, in which view I certainly feel strongly disposed to concur. M. Marchal, of Brussels, is, I believe, at present engaged in the study of the order: his task will be a very difficult one, for it is abundantly evident that all the genera require a thorough recasting.

My attention was directed to this group by receiving from Mr. Ford, Superintendent of the Hong Kong Botanic Gardens, herbarium specimens of a plant of which he brought two living examples from the Calcutta Garden in 1876, given him by Dr. George King, the Director, as *Brassaiopsis hispida*, Seem. On examining this, I was very greatly surprised to find, not only that it had nothing to do with the genus to which it had been referred, but that it would not fall under any one, as hitherto characterized, and

---

* See the remarks of Dr. Beccari on *Osmoxylon* ('Malesia,' i. 104), which invalidates the claim of *Plerandreæ* to be maintained as a series: Baillon had previously denied that of *Mackinlayieæ* ('Adansonia,' xii. 131).

† Gen. Plant. i. 932.

ormed a very distinct new section in *Plerandra*,* distinguished by having eight petals, sixteen uniseriate stamens, a 12–13-celled ovary, and simple exstipulate leaves, for which I propose the name of *Diplasandra*. The origin of the plant is quite uncertain; it may have come from the Andamans or New Guinea, but it is perhaps more likely to be Polynesian. I subjoin a diagnosis, drawn up from living specimens:—

1551 Plerandra (*Diplasandra*) jatrophifolia, sp. nov. — Arbuscula caule aculeis sparsis rectis armato, foliis petiolo 2–4-pedali aculeis parcis brevissimis prædito fultis simplicibus rigidis coriaceis glabris 1–2-pedalibus ambitu orbiculatis valide palmatim 9-nerviis ultra medium in lobos 7 palmatim divisis lobis parce incisis serratis, umbellis pedunculatis multifloris in paniculam amplam terminalem divaricato-ramosam dispositis, pedicellis sesquipollicaribus inarticulatis, floribus diametro semipollicaribus, calycis tubo hemisphærico levi limbo brevissimo truncato multidenticulato scarioso, petalis plerumque 8 liberis flaventibus crassis ovato-triangulatis apice incurvis uninerviis symptyxi valvatis, staminibus duplo petalorum numero uniseriatis petala vix superantibus filamentis crassiusculis subulatis antheris oblongis, disco complanato foveolis 16 radiantibus notato medio in conum stylare validum subcompressam abeunte, ovario 12–13 loculari, stigmatibus circ. 13 in anulum ad coni stylini apicem connatis, fructu globoso Cerasi mole.

Culta in hort. bot. Hongkongensi, ubi flores fructusque primum mm. Martio Aprili a. 1880 præbuit. (Herb. propr. n. 21682).

A NEW TREE-FERN FROM JAMAICA.

By G. S. Jenman.

Cyathea monstrabila, Jenman, n. sp.—Trunk erect, 4 or more feet high, 3 inches in diameter; stipites 15–18 inches long, chestnut-brown below and straw-coloured higher, densely armed with short, mostly straight, spines, and clothed, especially on the upper side, at the base with linear, acuminate, castaneous scales; fronds spreading, 3 or 4 feet long, 15–20 inches wide, bi- (tri-) pinnate; pinnæ spreading, subdistant, nearly sessile, the superior sometimes furcate at the base, the larger ones 10 inches long and 4 inches wide; pinnulæ subdistant, sessile, ligulate, their apices obtuse and rounded, $1\frac{1}{2}$–$2\frac{1}{2}$ inches long, 4 or 5 lines wide, cut almost to the costulæ into close, broad, rounded, crenate and slightly decurrent lobes, which are 2 lines deep and rather more in width; rachis sparsely prickly, silky-pubescent down the face, as are the costæ and costulæ also; costæ furnished beneath with small, scattered, brownish scales, the costulæ with minute bullate scales, also dark; upper surface dull green, the under pale, subpruinose; texture firm; veins forked, spreading flabellately or 3 or more jugate; sori sparse, situated at the forking of the veins;

---

* I understand the genus substantially as limited by Baillon ('Adansonia,' xii. 136; Hist. d. pl. vii. 169); but respect for the opinion of so able a botanist as Mr. C. B. Clarke, who still keeps it distinct (Fl. Brit. Ind. ii. 740), makes me hesitate about including *Tupidanthus*.

involucre fragile, breaking down into 3 or more parts; receptacle elevated, scaly.

Jamaica; rare at Portland Gap, below Blue Mountain Peak, where it was recently discovered by Mr. Nock, late of the Government Cinchona Plantations. Very distinct from any of the other Jamaican species, and will be distinguished by the lax habit, narrow, ligulate round and subentire pinnulæ (resembling in cutting the pinnæ of *Nephrodium unitum*), and the broad shallow lobes, wider transversely than deep. The lowest pinnule is on the superior side of the costa, and this is usually enlarged, with a tendency to become furcate, the branch being again pinnato-pinnatifid. Mr. Nock says that, as seen growing in the forest, at a short distance it has the appearance of a *Marattia*.

IN MEMORY OF REGINALD PRYOR.

British botanists, more especially those of the "critical" school, will have noticed with regret the brief announcement (at p. 96) of the loss which they have sustained by the death of Mr. Alfred Reginald Pryor. He was born at Hatfield, in Hertfordshire, on April 24th, 1839. Never of a strong constitution, he was unable to carry out the intention which had been formed for him of attending one of the great public schools; and his delicate health was probably instrumental in directing his attention to literature and science. After a preparatory course of instruction at Tunbridge School, he proceeded to University College, Oxford, where he took his B.A. degree. About this time his attention was directed more especially to Botany, in which he had always taken an interest. In 1872 I published in the 'Transactions of the Newbury District Field Club' a paper upon Berkshire plants: this led to a correspondence with Mr. Pryor, who had botanized in that county; and from that period may be dated his more active interest in Botany. His first contribution to this Journal, in which most of his botanical papers appeared, was in 1873; since which time our pages have been enriched by notes and papers of increasing value, his last paper, which was not published until after his death, showing more fully than any of his previous contributions the extent of his critical and literary knowledge. In 1874 he associated himself with the Rev. R. H. Webb in the preparation of a Supplement to the 'Flora of Herts'; later on this idea developed into the plan of a fresh flora—a work which, during the last five years, occupied all his time and attention, although serious attacks of illness hindered its rapid progress. His notes on a proposed reissue of the Flora of Hertfordshire, published in 1875 in the 'Transactions' of the Watford (now Hertfordshire) Natural History Society (of which body he was a Vice-President), and a second paper on the same subject in 1876, are good examples of his painstaking work; in the latter he drew out a plan for the division of the county into sixteen districts, a number which he afterwards considerably reduced. He personally

visited the greater part of the county; I had the privilege of accompanying him on two or three of his excursions, and was greatly struck by his critical knowledge of plants, extending to forms not recognised in British books; as well as with the care and perseverance with which, at the close of the day, he would write out his rough notes in a form available for easy reference.

An unusually severe attack of illness in the winter of 1879–80 caused him to spend the early spring of the latter year abroad. On his return he devoted himself to the 'Flora' with renewed energy. His attention having been directed to certain matters connected with nomenclature, the idea suggested itself to me of drawing up for publication a new 'Nomenclator' or 'Pinax' of British plants. Into this idea Mr. Pryor entered with enthusiasm; his extensive botanical library enabled him to do much of the work at home, and about Christmas he paid several visits to the Natural History Museum in connection with this work, appearing in unusually good health and spirits, and looking forward to the issue of the first part of the 'Flora,' which was to have taken place in the spring of the present year. Early in January, however, he was alarmed by a serious attack of heart-disease, which left him prostrate; he was conveyed to Hastings, but became worse, and was brought home in February to die, his death occurring on the 18th of that month. On the 24th he was buried with the rites of the Catholic Church—which body he had joined while at Oxford in 1858—in the parish churchyard at Baldock.

As a critical botanist he had few equals; and his characteristic accuracy and extensive acquaintance not only with botanical literature, but with a variety of subjects, rendered an excursion with him of great interest. One who knew him well writes thus:—"His conversation was most pungent, amusing, clever, and at the same time kind. His keen clear mind helped him to appreciate the truths of Revelation in a most rare way. He was naturally a theologian—he saw the consequences of revealed truth so clearly and so logically. And then under his sharpness and definiteness of mind I always saw a tenderness of character." Another, more closely connected with him, said to me: "He never forgot anything which he had once read"; and, although this may sound exaggerated, it seemed almost justified by the fund of information, often extending to minute details, which he possessed upon matters connected with art and general literature, and which he was always ready to bring out to a sympathising listener. His graphic descriptions of the places which he visited were very amusing; and his letters were eminently characteristic. Like the great botanist who has so recently been taken from us—Mr. H. C. Watson—Mr. Pryor might have conveyed to those who were but slightly acquainted with him an idea of severity and hardness; he had an epigrammatic way of expressing himself which sometimes sounded harsh to those who did not know him; and his state of health sometimes caused him to be abrupt in manner and a little unsparing in censure. But those who knew him could not fail to detect beneath all this a genuine spirit of

kindness and sympathy with others; indeed, to such even the above sentence may read harshly, and seem to convey a false impression.

This is not the place in which to speak of his many acts of generosity and kindness, manifested chiefly, though not entirely, to his poorer co-religionists, and fully displayed in the disposition of his personal property. But the readers of this Journal will be glad to know that the Flora on which so much time and labour has been expended is not to remain unpublished. With his botanical library, his herbarium, and a bequest in money, this was willed to the Hertfordshire Natural History Society. The library is extensive; the herbarium is comparatively small, but is supplemented by that of the Rev. W. H. Coleman, which Mrs. Webb has presented to the Society; the British Museum Herbarium contains a large number of Mr. Pryor's specimens. The MS. Flora has been placed in my hands for editing by the Hertfordshire Society; it is fortunately in an advanced state, and, although it can never be what it would have been had its author lived to see it through the press, it will form a valuable and important addition to the list of county floras. Mrs. Alfred Pryor, Mr. Pryor's mother, has generously offered to contribute to the cost of its production. A prospectus of the work will shortly be issued, giving additional particulars.

JAMES BRITTEN.

SHORT NOTES.

PLANTAGO ARENARIA, W. & K.—In the month of August, 1879, I gathered this plant in great abundance in the sandy fields between the road and the sea at S. Brelade's, Jersey. There must have been many hundred plants, and it appeared to be thoroughly established, and not on, or near, ballast.—HENRY T. MENNELL.

NEW LOCALITY FOR CHARA STELLIGERA, Bauer.—On the 8th of August I found this *Chara* in great abundance in the Thirne, or Hundred Stream, near Potter Heigham, East Norfolk. It was growing intermixed with *Chara hispida*, *C. fragilis*, and other species of the genus, but the most abundant of all, and with nucules in fair number. This is about six miles from Filby Broad, its first-discovered station.—ARTHUR BENNETT.

NITELLA TENUISSIMA, Kütz., IN CAMBRIDGESHIRE.—Early in this month (August) I gathered this rare little *Nitella* in Burwell Fen, Cambridgeshire, where it was growing with *Chara aspera*, Willd., —a plant not given for the county in Prof. Babington's 'Flora' nor in the Messrs. Groves's 'Review,'—*C. fœtida* and *C. hispida*. Prof. Babington had not known of its being gathered for "more than twenty years," so Mr. Lynch wrote last year.—ARTHUR BENNETT.

Notes on Surrey Plants.—*Carex arenaria*, Linn.—This species, rare as an inland plant, is abundant on Frensham Common. In Frensham Little Pond *Chara aspera* occurs in profusion; also in one corner of the pond a very small compact form, which may be the var. *lacustris*. *Elatine hexandra* is abundant in the canal about Brookwood, and also in the pond in which Mr. Watson found *Sparganium affine*. This pond has unfortunately been thoroughly cleared of weeds, and the *Sparganium* has accordingly disappeared from its only Surrey station. In the Wey, at Guildford, *Potamogeton serratus*, Huds., occurs, and is well marked. I have seen this plant in several places, but never as it grows here, viz., in large dense masses, precluding the idea that this state is altogether dependent on the growth of the plant. The leaves of the plants from this station are remarkably entire, being only serrulate at the extreme tip.—W. H. Beeby.

Potamogeton mucronatus, Schrad., in Sussex and Hants.—I found the above last July in the canal between Billinghurst and Pulborough, West Sussex. It occurs just below New Bridge, near the former village, and also about half-way between the two places; in both stations only sparingly. Mr. Arthur Bennett has found a specimen from West Sussex in Borrer's herbarium, but I believe it has not been recorded for the county. There also occurs in this canal a small-flowered *Nuphar*. It is, in all its parts, less than half the size of the average *Nuphar lutea* of the canal, and the stigmatic rays are *nine* only, but it seems to be without the wavy edge to the stigma which characterises *intermedia*. I saw the leaves in several places, but could only obtain one flower. It may be a later bloomer than *N. lutea*, as I understand is the case with a small-flowered Canadian plant. *Potamogeton mucronatus* also occurs copiously in the Basingstoke Canal about Aldershot, both in Surrey and Hampshire, for which latter county it is, I believe, a new record. It was (July) in fine fruit at this station; but although the plant also occurs abundantly lower down the canal at Woking, it does not appear to fruit there at all. *P. rufescens* also occurred in the Basingstoke Canal near Aldershot; it is new to North Hants.—W. H. Beeby.

A Note on Specific Names.—Since the March number of the 'Journal of Botany' appeared, I have repeatedly been asked why should adjectival specific names derived from other genera be spelled with a small letter instead of a capital? I purpose answering this briefly, and at the same time take the opportunity of alluding to one or two matters related to it. It may be stated at the outset that we have a choice of three methods: (1) we may slavishly copy every name as set forth by its author; (2) we may copy his plan of working, following the spirit rather than the letter; (3) we may frame entirely novel methods of writing. The last may be set aside without further ceremony; the first plan would entangle us in absurdities without number. Here are a few samples of the guise under which some plants were first published

by Linnæus:—*Lythrum hylmifolia* [= *thymifolia*]; *Alstræmeria pelegiнæ* [= *pelegrina*]; *Cassia Sophera* [= *C. Sophora*, sec. auct. plur.]; *Amomum Gran. parad.*; *Veronica Anagall.* We are, therefore, obliged to follow the second plan, and adopt the sensible plan of finding out the master's method and falling in with it. Linnæus appears to have cared comparatively little for consistency in printing his specific names. Compare the following:—*Anthericum Asphodeloides*, and *Helonias asphodeloides*; *L. Thymifolia*, and *E. thymifolia*; *Stellaria Cerastoides*, and *Silene cerastoides*; *Cherleria Sedoides*, and *Penthorum sedoides*. It would be needless to give further examples; suffice it to say that without attempting a complete census, in at least three cases out of four, in spite of these variations, the usual practice of Linnæus was to use a small letter for specific names, excepting in the cases particularised under the headings a, b, d, and e on page 81 of this volume. As regards the item of using a capital in such cases as *Eucalyptus Globulus*, La Billardière, I do not think it can be maintained, as a rule; for if it were we must, perforce, alter such names as *Calystegia sepium*, R. Br., *Vicia sepium*, L., *Prunus avium*, L. (which is often written *Avium* in British books), *Sempervivum tectorum*, L., *Amomum mastichinorum*, Thev., and similar instances. I am indebted to Dr. Ahrling, of Arboga, for pointing out to me the earliest use of the binominal system of nomenclature by Linnæus: it occurs in the index of his 'Oländska och Gothländska resa,' which was published in 1745; whilst the 'Pan Suecus' was not issued before December, 1749.—B. D. Jackson.

Notices of Books and Memoirs.

Manual of British Botany, containing the Flowering Plants and Ferns, arranged according to the Natural Orders. By Charles Cardale Babington, M.A., F.R.S. Eighth edition, corrected throughout. London: Van Voorst, 1881 (pp. xlviii., 485).

The issue of a new edition of 'Babington's Manual' is always an event of great interest to the British botanist, especially if he be of the critical school. The words "corrected throughout" which appear upon the title-page are always amply justified by the contents of the volume; and although many of the alterations introduced into each successive edition seem in themselves trifling, they show a gratifying anxiety for accuracy in details, and that no pains have been spared to ensure a satisfactory result. Of the general scope and plan of a book so well known it is quite needless to speak. But a little space may be profitably occupied in pointing out the more important alterations which are contained in this eighth edition. The additions to the list of species and varieties are as follow; many of them are already familiar to our readers through the pages of this Journal:—

Ranunculus triphyllos, Wallr. A *Batrachium* from Guernsey, which, however, is not included in square brackets, as is usual with Channel Island plants.

Sagina apetala, L., *β. prostrata*, Bab. The prostrate form of this species, "common on gravel walks"; it was referred to, but not named in ed. 7.

**Lavatera sylvestris*, Brot. See 'Journ Bot.,' 1877, pp. 257–259, where it is recorded not only from the Scilly Isles, but also from Penzance.

[*Lathyrus sphæricus*, Retz. See 'Journ. Bot.,' 1874, p. 205.]

Rubus hemistemon, Müll. From Warwick, Cardigan, and Aberdeen.

R. discolor, W. & N., *β. pubigerus*, Bab.

R. hirtifolius, Müll., and *R. mutabilis*, Genev. These two Brambles find a place in Mr. Briggs's 'Flora of Plymouth.'

R. emersistylus, Müll. This was formerly placed under *R. fusco-ater* as var. *Briggsii*.

R. foliosus, Weihe, *β. R. adornatus*, Müll.

R. Kochleri, Weihe, *δ. R. cuvatifolius*, Müll.

**Claytonia alsinoides*, Sims.

Apium nodiflorum, Reich., *γ. ocreatum*.

Artemisia vulgaris, L., *β. A. coarctata*, Forcell.

Senecio spathulatus, DC. This is the Holyhead plant which has in preceding editions been regarded as a variety of *S. campestris*, DC. Nyman ('Conspectus,' p. 352) places this under *Cineraria lanceolata*, Lam., but does not give it as British.

Hieracium Dewari, Syme.

Campanula rotundifolia, L., var. *arctica*, Lange (Innis Boffin, Ireland). This seems to be the variety called *speciosa* in 'Journ. Bot.,' 1876, p. 373.

Erythræa capitata, Willd. See 'Journ. Bot.,' 1881, p. 87, where, besides the Isle of Wight locality given by Prof. Babington, it is recorded from Newhaven, Sussex, by Mr. Townsend. A section of the genus, characterised by having the "stamens from base of cor.-tube," has had to be formed for this remarkable little plant, which stands in the 'Botanical Exchange Club Report' for 1880 as *E. sphærocephala*, Townsend; it has not, however, previously been actually published under that name.* *E. tenuiflora*, Link (see 'Journ. Bot.,' 1879, p. 329), is placed by Babington as a variety of *E. pulchella*, Fr.—an opinion in which we fully concur; Nyman, however ('Conspectus,' p. 502), follows Grisebach, Willkomm, Grenier and Godron, and other continental botanists, in uniting it with *E. latifolia*, Sm.; a proceeding against which we have protested in this Journal for 1872 (p. 167).

Utricularia Bremii, Heer. See 'Journ. Bot.,' 1876, p. 146. Although numbered, this is placed in square brackets, and is only spoken of as "probably" growing "in Moss of Inshoch, Nairn, and Loch of Spynie."

---

* The proper name of the English plant is *Erythræa capitata*, Willd., var. *sphærocephala*, Townsend.

Plantago intermedia, Gilib. (placed under *P. major*, L.) "L. downy, scapes terete downy arcuate spreading, is probably distinct. It is not very rare in England."

Rumex rupestris, Le Gall. See 'Journ. Bot.,' 1876, 1.

Salix Sadleri, Syme. "I have not seen this plant, and it may be misplaced here." See 'Journ. Bot.,' 1875, p. 33.

Epipactis violacea, Br. = *E. media*, Fr. β. *purpurata* of ed. 7. See 'Journ. Bot.,' 1881, p. 71.

Potamogeton Zizii, Roth. See 'Journ. Bot.,' 1879, p. 289.

Carex ornithopoda, Willd. See 'Journ. Bot.,' 1875, p. 192.

C. pilulifera, L., var. *Leesii*, Ridley. See 'Journ. Bot.,' 1881, p. 97. The locality "Glen Callater, Braemar," is given in addition to the original one.

Anthoxanthum Puellii [*Puelii*], Lec. & Lam. See 'Journ. Bot.,' 1875, p. 1. Admitted as a true native.

C. frigida, All. See 'Journ. Bot.,' 1875, p. 34.

Nitella prolifera, Kütz.

Chara stelligera, Bauer. See 'Journ. Bot.,' 1881, p. 1. We note that this name is allowed to stand, instead of *C. obtusa*, Desv., with which the Messrs. Groves identify *C. stelligera*.

C. contraria, A. Br. "Frensham Little Pond, Surrey (1881), Mr. W. H. Beeby." The first announcement of this species as British.

C. polyacantha, Braun.

C. baltica, Fr. First notice as British.

C. connivens, Braun.

C. fragifera, Desv.

The account of the *Characeæ* is almost entirely re-written, and repeated reference is made to "Messrs. Groves's valuable paper" in this Journal for 1880. The genus *Nitella* is separated from *Chara*, with which it was combined in preceding editions.

As a set-off against these additions, we note the disappearance of a considerable number of plants whose always doubtful claims to admission in British lists may now be considered finally disposed of. Such, for example, are *Cardamine bellidifolia*, *Silene alpestris*, *Arenaria fastigiata*, *Stellaria scapigera*, *Spergula pentandra*, *Malva verticillata*, *Hypericum barbatum*, *Staphylea pinnata*, *Potentilla alba*, *P. tridentata*, *Rosa rubella*, *R. Dicksoni*, *R. cinnamomea*, *Cotyledon lutea*, *Chærophyllum aureum*, *C. aromaticum*, *Gentiana acaulis*, *Swertia perennis*, *Echinospermum Lappula*, *Euphorbia Characias*, *Salix petiolaris*, *S. hastata*, *Crocus sativus*, *Scilla bifolia*, *Juncus tenuis*, *Typha minor*, *Carex hordeiformis*, and *Lycopodium complanatum*. Some of our older botanists may be inclined to regret, upon sentimental grounds, the rejection of names which have always been familiar to them in British books; but, with the possible exception of *Echinospermum Lappula*, which makes its appearance from time to time, although in no great quantity, the plants above named have no more claim to appear in our lists than others which have disappeared at an earlier date—such as *Ranunculus gramineus*, *R. alpestris*, and *Papaver nudicaule*. We should not have been

sorry had the list of exclusions been extended so as to include *Sempervivum tectorum* and *Erinus alpinus*. There are a few omissions upon other grounds: *Thalictrum saxatile*, for example, of ed. 7, "appears to be a smaller form" of *T. majus*, and is placed with it; and *Potentilla intermedia*, *Rumex limosus*, and *Parietaria erecta* have disappeared; there is no reference to *Ranunculus Boreanus* under *R. acris*, and *Rubus Leesii*, the distinct position of which has for some time been doubtful, becomes a variety of *R. Idæus*.

The changes in nomenclature are few; fewer indeed than we suspect would be the case if "the author's wish to adopt in all cases those names which have the claim of priority unless good cause should be shown for a contrary proceeding" had been strictly carried out. We are glad to welcome back *Arenaria trinervia* (the specific name erroneously spelt with a capital initial letter) after its long exclusion in favour of *A. trinervis* (see 'Journ. Bot.,' 1881, p. 78); *Rubus præruptorum*, Boul., replaces *R. pygmæus*, "Bab., not Weihe" of ed. 7; *Rosa bibracteata*, Bast., formerly ranked as a variety of *R. arvensis*, now supersedes *R. stylosa* of ed. 7; *Crepis hieracioides*, W. & K., takes precedence of *C. succisæfolia*, Tausch.; *Hieracium pratense*, Fr., replaces "*H. dubium*, L.—Fr.," of ed. 7 as a name for the plant figured and described in this Journal for 1868 as *H. collinum*; *Atriplex deltoidea*, β. *triangularis*, takes now the varietal name *salina*; *Romulea Columnæ* Reich., supersedes *Trichonema*; *Crocus argentea*, Salisb., replaces *C. biflorus*, Müll.; the variety β. of *Agrostis alba* is *A. stolonifera*, L., instead of *subrepens*. Here and there a name for a previously unnamed variety has slipped in; as in the case of the prostrate form of *Sagina apetala*, already referred to, and in that of the purple-flowered Scilly form of *Trifolium repens*, which is here called *T. Townsendii*. Even so small a matter as the including of certain species in square brackets has been attended to and revised; we find the following plants, *Tamarix anglica*, *Pulmonaria officinalis*, and *Rumex conspersus* so distinguished now, which were not bracketed in ed. 7; while the brackets have been removed from *Œnothera biennis*, *Œ. macrocarpa*, *Centranthus Calcitrapa*, *Valeriana pyrenaica*, *Lycium barbarum*, *Allium triquetrum*, and *Serrafalcus arvensis*. One or two introductions seem to us to deserve the *, which signifies "certainly naturalized," at least as much as some, if not all, of the preceding; *Lepidium Draba*, for instance, although mainly increasing by means of roots, nevertheless sometimes produces ripe seed; *Geranium striatum* seems to deserve a rather more detailed notice, as it is "quite established" about Plymouth (see 'Flora of Plymouth,' p. 69) and elsewhere.

A few small matters seem to have escaped notice: *Nuphar pumila*, for instance, is of Smith, not of DeCandolle; *Galium cruciatum* should be *Galium Cruciata*; *Carduus Woodwardsii* (p. 208) should be *C. Woodwardii*; *Polygonum maculatum*, Dyer, should be assigned to Dyer & Trimen (see 'Journ. Bot.,' 1871, p. 36); and "Knapwell" (p. 64, and in Index) should be "Knawell." These are small matters; but it would be well to prevent their repetition

in another edition. We are glad to note that "Huds." is substituted for "L." as the authority for *Trifolium medium*. In a few cases the records in this Journal, which are as a rule referred to in important cases, seem to have been overlooked: *e.g.*, the range of *Barbarea stricta* in the London district extends considerably beyond the "Thames near Kew" (see 'Journ. Bot.,' 1871, p. 213; 1878, p. 347); the Somersetshire station for *Althæa hirsuta* (where Mr. Baker considers it "a true native," 'Journ. Bot.,' 1875, p. 358) should have been added, as well as the Kent locality for *Lathyrus hirsutus* (*ib.*, 1878, p. 247); there is no mention of *Medicago lappacea*, a plant brought into notice by Mr. R. A. Pryor (*ib.*, 1876, p. 22), and seemingly at least as noteworthy as his *Lathyrus sphæricus*, which Prof. Babington includes; the established Asters might have been increased by a species which has long been quite at home in various localities near London (*ib.*, 1870, p. 8); and Mr. French showed clearly (*ib.*, 1875, p. 292) that *Salvia pratensis* in Oxfordshire was by no means restricted to the single locality of Middleton Stoney.

Some of the remarks added to this edition are very suggestive, as is also the way in which descriptions are often improved by the addition of characters previously unnoticed; such, for example, as those derived from the stamens and styles in the species of *Rubus*. Of this genus, Prof. Babington says that "when the continental plants are better known, it is feared that considerable changes of nomenclature will be necessary"; while of *Rosa* he writes, "We want a thorough monograph of this genus." *Ononis* has received important revision: *O. arvensis*, L., is stated to be stoloniferous, while *O. campestris*, Koch, is not so; of the former, two forms are given: "α. glandular, fl.–l. equalling or surpassing cal., pod shorter than calyx.—β. *maritima:* glandular-villose, fl.–l. falling short of cal., pod as long or longer than calyx." "Nutlets" is substituted for "nuts" in the descriptions of the fruit of *Labiatæ* and *Borragineæ*. The most important of the alterations which have attracted our notice (apart from the introduction of new species and others already mentioned) will be found in the genera *Euphrasia*, *Utricularia*, *Epipactis*, *Potamogeton*, *Zannichellia*, and *Phleum*.

It would savour of impertinence were we to compliment Professor Babington upon his work. But we may be allowed to congratulate British botanists upon the fact that the writer who has done more than anyone else to encourage the critical study of British plants, during a period extending over more than forty years is still working in their interest. J. B.

We have received from the authors, Messrs. Chas. F. Wheeler and Erwin F. Smith, a well-printed and handy 'Catalogue of the Phænogamous and Vascular Cryptogamous Plants of Michigan, indigenous, naturalized, and adventive.' The number of species enumerated is 1634; many additions are expected, as some parts of the State have been rarely visited by botanists. The Catalogue contains one new species, *Salix glaucophylla*, M. S. Bebb; and is

preceded by a good map of the State. We are sorry to see prominence given to so-called "English" names: such names as "Naked-gland Orchis" for *Habenaria tridentata*, or "Divaricate Phlox" for *Phlox divaricata*, have nothing to recommend them, and should not be encouraged.

The National Society has commenced the issue of a series of 'Botany Reading Books, in accordance with the New Code of 1880.' The first of these has reached us; it contains a good deal of information, expressed in the dialogue form which seems to be considered almost essential in books of the kind; and the cuts, although old friends, are clean and well chosen. This part is designed for the "second standard," and is devoted to "vegetable life, illustrated from plants easily met with." The author is the Rev. A. Johnson.

Our old correspondent, Dr. A. Ernst, of Caracas, sends us a summary of, course of lectures on systematic botany delivered by him in the University of that place, and devoted to brief diagnoses of the more important families of plants represented in the flora of Venezuela.

Mr. G. C. Druce is publishing what appears to be a carefully executed Flora of Northamptonshire in the 'Journal of the Northampton Natural History Society.' The 'Journal' itself deserves a word of praise on account of the great prominence given in its pages to local Natural History.

The 'Report of the Distributor [Mr. James Groves] for 1880' of the Botanical Exchange Club has been issued: we hope to give extracts from it in an early number.

New Books.—C. C. Babington, 'Manual of British Botany,' ed. viii. (London: Van Voorst, 10s. 6d.).—C. F. Wheeler and G. F. Smith, 'Catalogue of the Phænogamous and Vascular Cryptogamous Plants of Michigan' (Lansing: George, 1881; 50 cents.)

Articles in Journals.—July.

Botanical Gazette.—G. Engelmann, 'Additions to N. American Flora' (*Portulaca suffrutescens*, *Campanula scabrella*, spp. nov.).—C. H. Peck, 'New Species of Fungi' (*Uromyces Psoraleæ*, *U. Zygadeni*, *Æcidium Sarcobati*, *Synchytrium Jonesii*, *Bulgaria spongiosa*).

Botanische Zeitung.—H. Hoffmann, 'Retrospect of Researches in Variation in 1855–1880' (concluded).—T. W. Engelmann, 'New methods for investigating the giving off of Oxygen by plants.'—H. G. Reichenbach, 'Orchideæ Hildebrandtianæ.'—F. Kamienski, 'The Vegetative Organs of *Monotropa Hypopitys*.'—J. Rostafinski, 'On the Red Colouring-matter of some *Chlorophyceæ*.'—F. Darwin, 'On Circumnutation in some unicellular organs.'

Bulletin of Torrey Bot. Club (June).—G. E. Davenport, 'A new N. American Fern' (*Cheilanthes Parishii*, 1 tab.).—H. L. Fairchild, 'A recent determination of *Lepidodendron*.'—J. B. Ellis, 'New

N. American Fungi.'—W. G. Farlow, 'Unusual habit of *Coprinus*.' —Id., 'Note on *Laminariæ*.'—W. Trelease, 'Note on perforation of Flowers.'—M. E. Jones, 'Notes from Utah' (*Gilia scopulorum*, n. sp.).—(July). J. B. Ellis, 'New N. American Fungi.'—E. P. Bicknell, 'Stamens within the Ovary of *Salix*.'—F. L. Scribner, 'Cohesion of Glumes in *Agrostis elata*,' 'List of State and Local Floras of United States.'

Flora.—E. Arnold, 'Lichenological Fragments' (1 tab.) (concluded).—M. Gaudoger, 'Salices Novæ.'—H. G. Reichenbach, 'Orchideæ describuntur.'—D. Gronen, 'On two new Plants from Kärnten' (*Phyteuma confusum*, Kerner, and *Rhamnus carniolica*, Kerner).

Hedwigia.—G. v. Niessl, 'A new Pyrenomyceta' (*Leptosphæria mirabilis*).

Journal of the Linnean Society (Botany, vol. xviii., No. 113).—M. T. Masters, 'On the Conifers of Japan' (2 tab.).—C. B. Clarke, 'On [dimorphism in] *Arnebia* and *Macrotomia*.'

Magyar Novenytani Lapok.—Biography of Schleiden.

Naturalist.—W. West, 'Cryptogamic Reports for 1880 of Yorkshire Naturalists' Union' (continued).

Œsterreichische Bot. Zeitschrift.—J. A. Knapp, 'Vincent v. Borbas' (portrait).—C. Henning, 'On the torsion of Tree-stems as a principle of stability.'—A. Tomaschek, 'Development of lenticels in *Ampelopsis hederacea*.'—C. Untchj, 'On the Flora of Fume.'—G. Winter, 'On the *Æcidium* of *Triphragmium*.'—B. Blocki, 'On Dr. Weiss's Herbarium in Lemberg University.'—P. Sintenis, 'Flora of Cyprus' (contd.).—P. G. Strobl, 'Flora of Etna' (contd.).

Scottish Naturalist.—J. Stirton, 'On the genus *Usnea*, and another (*Eumitria*, gen. nov.) allied to it' (many new species).—J. Knox, 'Life of George Don' (contd.).—J. Stevenson, 'Mycologia Scotica' (contd.: *Peziza* (*Sarcoscypha*) *bulbocrinita*, Phillips MSS.).—J. Cameron, 'Gaelic Names of Plants' (contd.).—F. B. White, 'Preliminary List' of Perthshire Plants.

Botanical News.

We learn from the 'Bulletin' of the Torrey Club for July that Muhlenberg's Herbarium is in the possession of the American Philosophical Society of Philadelphia. Muhlenberg was one of the earliest American botanists,—he died in 1815,—and his collections, although at the present day they would be considered small, are of historic value as containing the materials upon which his descriptions were based. The plants are in fine preservation, but unfortunately are not localised.

Gottlob Ludwig Rabenhorst was born on the 22nd March, 1806, at Treuenbrietzen, in Brandenburg. After a private education

he entered on the study of pharmacy in 1822, and passed the necessary examination with much honour in 1830, after serving the conditional time, performing his military duties, and attending the Berlin University. In 1831 he married, and bought an apothecary's business in Luckau, in Niederlausitz. On the death of his first wife in 1840 he left his business and went to Dresden, where he devoted himself entirely to botanical studies. He obtained the degree of Doctor in Jena in 1841. From 1849, when he married a second time, to 1875, he remained in Dresden, prosecuting his work. In the latter year he removed to Villa Luisa, near Meissen. Age, and an affection of the heart, with its consequences, overtook him, and, in spite of his residence in the country, from which he had hoped for relief, at last ended in his death on the 24th of April of this year. As early as the time of his pharmaceutical studies, Rabenhorst earnestly carried on botanical researches, as appears from the 'Flora Lusatica,' published in 1839–40; but after his removal to Dresden his activity in botanical matters increased. His works are so well known to our readers that it will not be necessary to say much of them here. A critical and very just estimate of them appeared in the 'Botanische Zeitung' for the 8th of July last, written by Prof. de Bary, from which the information as to his life given here is taken. Of perhaps his most useful work—the published sets of cryptogamous plants—it may be well to say that they receive the highest praise from the Professor. One point as to the nature of these collections it may be well to notice. Rabenhorst treated them (consisting as they did largely of contributions from correspondents) as an editor of a scientific journal treats the authors of the papers it contains, namely, he gave it to be understood that each contributor is responsible for the nature and naming of his specimens. Looking at these published sets with this in mind they are, says Prof. de Bary, "an unrivalled performance," and those who have had occasion to prove their usefulness will heartily concur. In addition to his systematic books, he was editor until 1878 of 'Hedwigia.'

John Duncan, 'weaver and botanist,' died at Alford, Aberdeenshire, on the 9th of August. He was born at Stonehaven, in Kincardineshire, on December 24th, 1794, was early sent to work, and became a country weaver—an occupation which he followed until his death. He was a man of little education, but from an early period took much interest in Natural History. In 1835 he made the acquaintance of Charles Black, a working man, twenty years his junior, and apparently a man of a wider range of study and a more liberal education; and from that time his scientific study of plants may be said to date. His investigations of the local botany were painstaking and extensive; and these were for many years extended by his hiring himself as a harvester to farmers in different parts of the country, thus securing a fresh field for his observations, while at the same time adding to his income. His herbarium, which was extensive, containing over 1100 species, was lately presented, as noticed at p. 64 of this journal, to the University of Aberdeen. "His memory being as strong as his use of the

pen was weak, he did not write down any details of the plants collected, but he could tell all these when asked with unerring precision, as well as relate the varied incidents, interesting, humourous, happy or hard, connected with their discovery. The names and localities have been successfully obtained from him and written down by the help of one of his disciples, Mr. J. M. B. Taylor, of Aberdeen, who prepared the herbarium for the University." ('Nature,' Jan. 20, 1881). Interesting as his life must have been, and valuable as an example of what may be done under most unfavourable circumstances, it is scarcely more remarkable than the life spent by many working-men naturalists in Lancashire and Yorkshire at the present time. In saying this we are far from wishing to disparage in the faintest degree the subject of this notice; we only wish to show that so gratifying a trait is probably more widely extended than the readers and writers of the lives of men of the Duncan stamp are apt to suppose.

We learn from the 'Botanisches Centralblatt' that Dr. Oluf Eneroth, the author of the 'Svensk Pomona,' an elaborately illustrated work, died at Upsala on 21st May last. He was born 15th April, 1825, and was therefore in his fifty-sixth year.

Matthias Jakob Schleiden, who died 23rd June of this year at Frankfurt-am-Main, was born 5th April, 1804, at Hamburg. He was intended for the legal profession, but not liking it he turned his attention to botany, and in 1839 was appointed Professor at Jena; in 1863 being transferred to Dorpat. Pritzel gives fifteen titles, exclusive of translations, as proceeding from his pen, the most widely-known being his 'Grundzüge der wissenschaftlichen Botanik' in 1842–43, of which an English version, by Dr. Edwin Lankester, was issued in 1849. His latest productions were 'Die Rose, Geschichte und Symbolik,' in 1873; and a pamphlet on the importance of the Jews in the Middle Ages, in 1877.

Michael Pakenham Edgeworth, brother of Miss Edgeworth the novelist, died on the 30th of July in the island of Eigg, Inverness-shire, aged 69. He belonged to the Civil Service Department of the Bengal Presidency, and paid great attention to botany whilst in India. His principal papers on the subject are :—"Descriptions of some unpublished species of plants from North-Western India," in the Linnean Society's Transactions, vol. xx.; "Catalogue of plants found in the Banda district, 1847–49"; and "A couple of hours' herborisation at Aden," in vol. xxvi. of the 'Journal of the Asiatic Society of Bengal'; and his "Florula Mallica" and "Flora of Banda," in the 6th and 9th volumes of the 'Journal of the Linnean Society.' His most recent systematic work is in the 'Flora of British India,' for which (in 1874), in conjunction with Sir J. D. Hooker, he monographed the *Caryophyllaceæ*. His collections are in the Kew Herbarium. He came home to England many years ago, with health a good deal impaired, and since then has resided in the neighbourhood of London. During the later years of his life he worked a good deal with the microscope, and his book on 'Pollen' was noticed at p. 315 of this Journal for 1877; a second edition of this was published in 1879.

Original Articles.

ON THE NATURAL ORDER *TACCACEÆ*; WITH DESCRIPTION OF A NEW GENUS.

By Henry Fletcher Hance, Ph.D., F.L.S., &c.

The small order of *Taccaceæ* has consisted hitherto of but two genera, containing about a dozen or rather more species, distributed throughout the mountainous regions of India, the Malayan archipelago, the Philippines, Australia, Polynesia, Madagascar, and Guiana. Its relationship has been diversely interpreted. *Tacca* was placed by A. L. de Jussieu, together with *Hypoxis*, *Pontederia*, *Polianthes*, and *Alstrœmeria*, amongst the "genera Narcissis non omnino affinia," of the precise position of which he felt no doubt.* Robert Brown remarked—"Inter Aroideas et Aristolochias locanda sit *Tacca*, illarum nonnullis foliis peculiaribus similis, nec seminum germinatione multum diversa; his tamen floris et pericarpii structura propius accedens"†; and a similar view was taken by Blume. The elder Reichenbach located *Tacca* in his family *Aroideæ*, associating with it *Acorus*, *Orontium*, *Peliosantheæ*, *Eriospermeæ*, and *Tupistreæ*, as well as *Nepenthes*, *Sarracenia*, and *Roxburghia*.‡ At a later period, in a work apparently little known to botanists, he made several important modifications in this scheme,—transferring *Acorus*, *Eriospermeæ*, and *Roxburghia* to *Smilaceæ*, at some distance from *Aroideæ*, bringing *Nepenthes* and *Nymphæaceæ* under *Hydrocharideæ*, and altogether removing *Sarracenia* to *Cistineæ*.§ Bartling ranged it as a special family of his grand division Dicotyledoneæ chlamydoblastæ, between *Asarineæ*, in his class *Aristolochieæ*, and *Saururea* in that of *Piperineæ*.‖ Lindley, in his 'Nixus Plantarum' (1833), placed it next to *Burmanniaceæ*, at the end of his Narcissales, in the epigynous cohort of Endogens, and touching *Irideæ* in *Ixiales*; but in his latest work he considered the true relation to be with *Araceæ*, or at least with those bisexually-flowering genera which he separated under the name of *Orontiaceæ*, and of which these appeared to him to be an epigynous form: he added that the resemblance to *Aristolochiaceæ* seemed so slight as to be unworthy of notice.¶ By Martius *Taccieæ* were classed in his cohort Stegocarpeæ hexandræ, between *Dioscoreæ* and *Hypoxideæ*;** whilst Herbert, though he doubtfully enumerated

---

* Gen. Plant. 55 (1789).
† Prodr. Fl. Nov. Holl., Isis edn. 882 (1810).
‡ Conspect. regn. veg. 44 (1828).
§ Repert. herbarii, 32, 34, 188 (1841).
‖ Ord. nat. plant. 82 (1830).
¶ Veg. Kingd. 149 (1845).
** Consp. regn. veg. 9 (1835).

them as a suborder of *Amaryllidaceæ*, declared it as his opinion that this was not their true place, but that they formed a distinct "subspadiceous subcorolliform" order, with an evident affinity to *Orontiaceæ*.* Endlicher, remarking that by artificial characters they must be stationed next *Dioscoreaceæ*, considered their natural position to be between *Araceæ* and *Aristolochiaceæ*.† Perleb expressed utter uncertainty as to their systematic place;‡ whilst Baskerville inserted them between *Araceæ* and *Pandanaceæ*;§ A. Brongniart between *Asteliea* and *Dioscorideæ*, in his class *Lirioideæ*;‖ Meissner between *Liliaceæ* and *Dioscoreaceæ*;¶ Horaninow at first between *Tamaceæ* and *Pandanaceæ*, combining with them *Tupistreæ* and *Peliosantheæ*,** but in a subsequent publication between *Tamaceæ* and *Araceæ*, adding to them *Thismieæ*.†† According to Kunth the family stands between *Dioscoreaceæ* and *Amaryllidaceæ*;‡‡ whilst Grisebach reduced both it and *Amaryllidaceæ* to mere tribes of *Liliaceæ*.§§ J. G. Agardh writes:—"*Taccaceæ* sunt *Aristolochieis*, *Dioscoreis*, *Bromeliaceis*, *Roxburghiaceis* plus minus analogæ, *Aspidistreis* proxime collaterales, formam superiorum hermaphroditam Cryptocorynearum, ut videtur, constituentes."‖‖ Miquel placed *Taccaceæ* between *Dioscoreaceæ* and *Iridaceæ*;¶¶ J. D. Hooker merges them in *Burmanniaceæ*, stationed between *Amaryllidaceæ* and *Dioscoreaceæ*;*** and in Alexander Braun's classification, now a good deal followed in Germany, they stand between *Dioscoreaceæ* and *Hæmodoraceæ*.††† In his very original system of classification, Mr. Benjamin Clarke places *Taccaceæ* in the same alliance with *Burmanniaceæ*, in his Orchidal group of procarpous endorrhizal Endogens, and he remarks that he has no doubt the family is nearly allied to *Orchidaceæ*.‡‡‡ Simultaneously also Baillon, as the result of an organogenic study of the flowers of *Tacca*, arrived at the conclusion that *Taccaceæ* are substantially *Orchidaceæ* with regular flowers.§§§ Le Maout and Decaisne, following as they say A. de Jussieu, ranged the order between *Iridaceæ* and *Dioscoreaceæ*.‖‖‖ In a paper on *Aristolochia*, Dr. Masters showed that, regard being had to a number of the most important characters which they possess in common, *Taccaceæ* hold about the same relation to *Aristolochiaceæ* as *Santalaceæ* and *Araceæ*, but agree less than do *Dioscoreaceæ*;¶¶¶ but he of course admitted that the dicotyledonous orders were *ipso facto* removed from close affinity. M. Lerolle, in a brief note on the arrangement of Monocotyledons, places *Taccaceæ* in the Amarylloideous alliance of his petaloid Monocotyledons, next

---

* *Amaryllidaceæ*, 45, 48, 63, 333 (1836).
† Gen. Plant. 139 (1836); Enchir. bot. 93 (1841).
‡ Clavis regn. veg. 14 note (1838).
§ Affin. of Plants, 92 (1839).
‖ Enum. d. genr. de pl. xv. (1843).
¶ Plant. vasc. gen. 403 (1843).
** Tetractys Naturæ, 23 (1843).
†† Prodr. monogr. Scitam. 4, note (1872).
‡‡ Enum. plant. v. 457 (1850).
§§ Grundr. d. syst. Bot. 164 (1854).
‖‖‖ Theor. syst. plant. 33 (1858).
¶¶ Fl. Ind. bot. iii. 576 (1859).
*** In Thwaites's Enum. pl. Zeyl. 325 (1864).
††† Given in Sachs's Text-book of Bot. 555 (1864).
‡‡‡ New arrangem. of Phanerog. Pl. 10, tab. 1 (1866).
§§§ Adansonia, vi. 242 (1866).
‖‖‖‖ Traité gén. de bot. 572 (1868).
¶¶¶ Journ. Linn. Soc. xiv. 491 (1875).

to *Dioscoreaceæ*;* and Eichler, who alludes to them under that family, avows that he can say nothing of them from his own investigations.† In his last sketch of the systematic grouping of Monocotyledons, Bentham stations *Taccaceæ* in his epigynous cohort, between *Amaryllidaceæ* and *Dioscoreaceæ*, considering *Burmanniaceæ* as a very fairly limited distinct order.‡ And finally, to close this long, and I fear, to the reader, tedious recapitulation, Beccari has recently expressed his opinion that *Taccaceæ* are closely allied to *Dioscoreaceæ*, *Burmanniaceæ* (including *Thismia*), *Rafflesiaceæ*, and *Aristolochiaceæ*, all of which orders he regards as belonging to Monocotyledons.§

From the above view it will, I think, appear that a majority of modern botanists are disposed to regard *Taccaceæ* as most nearly allied to *Amaryllidaceæ* (*sensu latiore*) and *Dioscoreaceæ*. Without entering into any general discussion, I may say that I am unable to concur in the view maintained by Brown, Reichenbach, and J. D. Agardh that there is a direct affinity with *Araceæ*, considering the asserted resemblances as merely *simulamina*; that I cannot help also regarding the relationship with *Aspidistra*, *Tupistra*, and especially *Plectogyne*, which later botanists have been disposed, as it seems to me, to rate too low, as very close indeed, more so than with *Amaryllidaceæ*, notwithstanding their hypogynous flowers and few-seeded fruit; and the varying degree of cohesion with or freedom from the ovary of the calyx-tube in *Bromeliaceæ* may, I suppose, be adduced as an argument in favour of my view. I believe also that there is a singular analogy, if nothing more, through *Asarum*, with *Aristolochiaceæ*, which indeed seem to stand on the line separating the two vast primary divisions of the world of phænogamous plants. I fail to recognise any direct affinity with *Orchidaceæ*.

As already observed, the order has hitherto consisted of but two genera, *Tacca* and *Ataccia*, the latter differing in comparatively few particulars, so that it has been admitted with hesitation by some writers,‖ and altogether rejected by others, as Miquel, Bentham, and J. D. Hooker. The differential characters, as given by authors, may be thus formulated :—

Tacca.	*Ataccia*.
1. Perigone-lobes nearly equal.	Perigone-lobes unequal.
2. Filaments cucullate upwards.	Filaments concave upwards.
3. Style 3-lobed at apex, lobes bifid.	Style 3-lobed at apex, lobes emarginate.
4. Fruit 1-celled.	Fruit semi-trilocular.
5. Embryo next the basal hilum.	Embryo basal, remote from the ventral hilum.
6. Leaves much divided.	Leaves quite entire.

* Bull. soc. bot. de France, xxii. 270 (1875).

† Blüthendiagramme, i. 159 (1875).

‡ Journ. Linn. Soc. xv. 493-4 (1877).

§ Malesia, i. 248 (1878).

‖ "An genus satis a *Tacca* diversum"? (Endl. Gen. 159 ; Kunth, Enum. Plant. v. 464). "Genre à peine autonome" (Baillon, Dict. de bot. i. 307).

Now it appears to me that these differences, in so small and comparatively isolated a family, are amply sufficient to justify the retention of both *Tacca* and *Ataccia*; if this, however, be contested, the discovery of the very distinct and well-marked genus with which I have now the good fortune to augment this interesting group demonstrates, I conceive, the necessity of so doing. For, whilst it agrees with *Tacca* in the second, fourth, and fifth of the characters above noted, it accords with *Ataccia* in the first, third, and sixth, disagreeing with both notably, besides a few minor points, by its capsular fruit, from which circumstance I have given it the name of

SCHIZOCAPSA.

Perigonium calycinum; tubus cum ovario connatus; limbus superus, sexpartitus, inæqualis, demum deciduus. Stamina 6, ea laciniis perigonii exterioribus opposita infra medium ipsarum, ea laciniis interioribus opposita juxta basin inserta; filamentis basi ad utrumque latus processu carnosula auctis, brevibus, apice cucullatis, intus in cornua duo brevia deorsum productis; antheris inter cornua adfixis, loculis parallelis, adproximatis. Ovarium cum perigonii tubum connatum, 1-loculare; placentis parietalibus tribus, nerviformibus. Ovula plurima, adscendentia, ope funiculi adfixa, horizontalia, anatropa. Stylus brevis, 3-lamellato-alatus, alis inferne glanduloso-fimbriolatis, lobis 3 verticis umbraculiformis, latis, emarginatis, purpureo-marginatis, infra stigmatiferis, alternantibus, iisque æquilongis, alulisque 3 vix prominulis, glanduloso-fimbriolatis, iis interjectis. Capsula 1-locularis, secus angulos in valvas 3 spongiosas mox recurvas, medio seminiferas, ad basin usque dehiscens. Semina oblonga, curvula, testa primum vesiculosa, mucosa, demum sicca, brunnea, longitudinaliter sulcato-striata. Embryo minimus, in basi albuminis carnosi, hilo proximus.

Herba austro-chinensis, radice perenni, tuberosa; foliis radicalibus, integris, nervosis, ptyxi plicativo-conduplicata; scapis indivisis, floribus umbellatis, pedicellatis, pedicellis angulatis, sterilibus filiformibus intermixtis, basi involucro tetraphyllo foliaceo, fultis.

5† S. PLANTAGINEA.—Tota glaberrima, foliis latiuscule lanceolatis integerrimis acutis inferne undulato-crispis in petiolum semi-pollicarem basi vaginantem sensim angustatis 8–9 poll. longis 2–2¼ poll. latis costulis arcuatis utrinque 5–6 supra impressis subtus elevatis primordialibus orbiculato-ovatis longius petiolatis, scapis ancipitibus plurisulcatis 3-pollicaribus prostratis, involucri phyllis 4 æqualibus ovatis acutis 10 lin. longis, umbella 15–20-flora,* floribus pedicello angulato 7-lineali fultis filamentis filiformibus† flavis eos duplo superantibus intermixtis, perigonii flaventi-viridis lobis exterioribus lanceolatis primum erectis mox

* According to Baillon (Adans. vi. 248) the inflorescence is really composed of *cincinni*, or uniparous scorpioid cymes.

† Baillon suspects these may really represent lateral bractlets rather than abortive pedicels, as they are always described to be.

reflexis interiores late ovatos emarginatos primo conniventes demum erectos duplo superantibus, capsula trigona vertice convexo-complanata vestigiis alarum styli notata primum perigonii laciniis marcescentibus mox delapsis coronata.

In prov. Cantonensi, secus fl. North River, m. Januario 1879 detexit Rev. E. Faber, societatis Rhenanæ apud Sinas missionarius. (Herb. propr. n. 21033.)

I may note that the above description is drawn up from the living plant, which I have had in cultivation for upwards of a year and a half, flowering and ripening fruit in profusion.

NOTES ON THE FLORA OF DERBYSHIRE.

By the Rev. W. H. Painter.

(Concluded from p. 250.)

Verbena officinalis, Linn. IV. Linton, *Harris*; Morley, *Whittaker*; Melbourne! Borrowash, *Smith*.

Lycopus europæus, Linn. IV. Repton, *Hagger*; Derby!

Mentha rotundifolia, Linn. I. Miller's Dale, *Whitelegg*.

M. Piperita, Huds. IV. Winshill, *Harris*.

M. sylvestris, Linn. II. Aldercar, *Smith*.

M. hirsuta, Linn. IV. Morley!

M. sativa, Linn. I. Youlgreave, *Bailey*. IV. Derby!

M. arvensis, Linn. I. Youlgreave, *Bailey*. IV. Burton-on-Trent, *Harris*.

Thymus Serpyllum, Fries. I. Baslow, *Bailey*; Castleton! Buxton! Dove Dale! IV. Burton-on-Trent, *Harris*.

Origanum vulgare, Linn. I. Youlgreave, *Bailey*; Ashwood Dale!

Calamintha Clinopodium, Spenn. I. Lathkill Dale; Via Gellia, *Bailey*; Monsal Dale! Dove Dale! IV. Burton-on-Trent, *Harris*.

C. Acinos, Clairv. I. Wormhill, *West*; Dove Dale! IV. Foremark, *Harris*.

C. menthifolia, Host. IV. Ockbrook, *Smith*; Linton, *Harris*.

Nepeta Glechoma, Benth. Common.

Prunella vulgaris, Linn. Common.

Scutellaria galericulata, Linn. IV. Burton-on-Trent, *Harris*; Derby!

S. minor, Linn. IV. Repton Shrubs, *Hagger*.

Ballota nigra, Linn., var. *fœtida*, Linn. IV. Derby! Stapenhill, *Harris*.

Stachys Betonica, Benth. I., IV. Heaths, common.

S. palustris, Linn. IV. Burton-on-Trent, *Harris*; Spondon!

S. ambigua, Sm. I. Baslow; Hassop, *Bailey*. IV. Linton, *Harris*; Willington!

S. sylvatica, Linn. Common.

S. arvensis, Linn. IV. Cauldwell, *Harris*; near Duffield!

Galeopsis Ladanum, Linn. I. Monsal Dale, *Bailey*; Peak Forest Railway Station, *Wild.*; Dove Dale!

G. Tetrahit, Linn. Common.

Leonurus Cardiaca, Linn. I. Via Gellia, *Whitelegg*.

Lamium amplexicaule, Linn. IV. Borrowash and Osmaston-by-Ashbourne, *Smith*; Drakelowe, *Harris*.

L. purpureum, Linn. Common.

L. maculatum, Linn. I. Baslow, *Bailey*; Wirksworth, *Harris*.

L. album, Linn. Common.

L. Galeobdolon, Crantz. I. Stirrup Wood, Charlesworth, *Wild.*; Belper! Buxton! Repton Shrubs, *Harris*.

Ajuga reptans, Linn. IV. Morley! Repton Shrubs, *Hagger*; Burton-on-Trent, *Harris*.

Teucrium Scorodonia, Linn. Heaths, common.

Echium vulgare, Linn. IV. Willington, *Playne*; Winshill and Drakelowe, *Harris*.

Lithospermum officinale, Linn. I. Via Gellia, *Rev. H. Miles*. IV. Stapenhill, *Harris*.

L. arvense, Linn. IV. Repton, *Playne*; Burton-on-Trent, *Harris*.

Myosotis cæspitosa, Schultz, I. Ashford-in-the-Water, *Bailey*. IV. Burton-on-Trent, *Harris*; Willington! Swarkestone Bridge!

M. palustris, With. Common. Var. *strigulosa*, Reich. IV. Morley, Whittaker.

M. repens, Don. I. Kinder Scout, *Bailey*; Charlesworth Coombes, *Whitelegg*; Axe Edge, *West*; Coombes Moss!

M. sylvatica, Ehrh. I. Disley, *Bailey*; Marple, *Wild*; Miller's Dale, *Whitelegg*; Via Gellia! Ashford Dale! Cressbrook Dale! Dove Dale, *Harris*.

M. arvensis, Hoffm. Common.

M. collina, Reich. I. Miller's Dale, *Bailey*; Monsal Dale! Matlock Bath! Wirksworth! Dove Dale, *Harris*. IV. Drakelowe, *Harris*.

M. versicolor, Reich. I. Miller's Dale, *Wild*. IV. Repton, *Playne*; Drakelowe, *Harris*; Willington!

Symphytum officinale, Linn. I. Via Gellia, *Bailey*. IV. Newton Solney, *Harris*; Derby!

Cynoglossum officinale, Linn. I. Bradford Dale, *Bailey*.

Pinguicula vulgaris, Linn. I. Bakewell Road, Buxton! Hadfield, *Whitelegg*.

Utricularia vulgaris, Linn. IV. Swarkestone, *Dr. Hewgill*; *Harris*.

Hottonia palustris, Linn. IV. Morley! Osmaston-by-Derby! Egginton, *Harris*.

Primula vulgaris, Huds. Common. Var. *intermedia*. I. Whatstandwell!

P. officinalis, Linn. Common.

Lysimachia Nummularia, Linn. IV. Repton, *Hagger*; Burton-on-Trent, *Harris*; Osmaston-by-Derby! Swarkestone!

L. nemorum, Linn. IV. Burton-on-Trent, *Harris*; Dale Abbey Woods!

Anagallis arvensis, Linn. Common.

Plantago major, Linn. Common.

P. media, Linn. Common.

P. lanceolata, Linn. Common.

P. Coronopus, Linn. IV. Little Eaton, near Derby! Cauldwell, *Harris*.

Chenopodium album, Linn. Common.

C. rubrum, Linn. IV. Repton, *Hagger*; Coton-in-the-Elms, *Harris*.

C. Bonus-Henricus, Linn. I. Wormhill, *West*; Miller's Dale! IV. Stapenhill, *Harris*; Breadsall! Swarkestone!

Atriplex angustifolia, Sm. I. Great Longstone! IV. Stapenhill, *Harris*.

Rumex conglomeratus, Murr. I. Bakewell, *Hannan*; Buxton! Dove Dale! IV. Burton-on-Trent, *Harris*; Breadsall!

R. nemorosus, var. *viridis*, Sibth. I. Bakewell, *Bailey*; Miller's Dale, *West*. IV. Burton-on-Trent, *Harris*.

R. obtusifolius, Auct. I. Dove Dale! IV. Burton-on-Trent, *Harris*.

R. crispus, Linn. Common.

R. Hydrolapathum, Huds. IV. Burton-on-Trent, *Harris*; Swarkestone! Osmaston-by-Derby.

**R. alpinus*, Linn. I. One Ash Grange, Monyash, *Bailey*.

R. Acetosa, Linn. I. Buxton! IV. Burton-on-Trent, *Harris*.

R. Acetosella, Linn. Heaths, common.

Polygonum Convolvulus, Linn. Common.

P. aviculare, Linn. Common.

P. Hydropiper, Linn. Common.

P. Persicaria, Linn. Common.

P. amphibium, Linn. IV. Bretby Ponds, *Harris*; Osmaston-by-Derby!

P. Bistorta, Linn. I. Charlesworth, *Hannan*; Wormhill, *West*. IV. Morley, *Whittaker*.

Daphne Laureola, Linn. I. Cromford, and IV. Morley, *Whittaker*; Ockbrook, *Smith*.

Empetrum nigrum, Linn. I. Glossop Moors, *Bailey*; Axe Edge!

Euphorbia Helioscopia, Linn. Common.

E. Peplus, Linn. Common.

E. exigua, Linn. IV. Cauldwell, *Harris*; Ockbrook!

Mercurialis perennis, Linn. Common.

Parietaria diffusa, Koch. IV. Repton.

Urtica dioica, Linn. Common.

U. urens, Linn. Common.

Humulus Lupulus, Linn. IV. Linton, *Harris*.

Ulmus montana, Sm. I. Lathkill Dale! IV. Burton-on-Trent, *Harris*.

Quercus Robur, Linn., var. *pedunculata*, Ehrh. IV. Morley!

Fagus sylvatica, Linn. IV. Kedleston! Burton-on-Trent, *Harris*.

Corylus Avellana, Linn. Common.

Carpinus Betulus, Linn. I. Buxton; Mellor, *Wild*. IV. Bretby, *Harris*.

Alnus glutinosa, Linn. I. Dove Dale. IV. Derby! Burton-on-Trent, *Harris*.

Betula alba, Linn. IV. Common.

Populus alba, Linn. I. Ashwood Dale! IV. Burton-on-Trent, *Harris*.

P. tremula, Linn. I. Cressbrook Dale, *Sutherland*.

P. canescens, Sm. I. Marple, *Wild*. IV. Bretby, *Harris*.

Salix pentandra, Linn. I. Ashwood Dale! IV. Hognaston, *Smith*; Egginton, *Harris*.

S. fragilis, Linn. I. Marple, and Mellor, *Hannan*. IV. Egginton, *Harris*.

S. alba, Linn. I. Cromford, *Sunderland & Hannan*. IV. Egginton, *Harris*. Var. *vitellina*, Linn. IV. Burton-on-Trent, *Harris*.

S. purpurea, Linn. I. Marple, *Hannan*. IV. Burton-on-Trent, *Harris*.

S. rubra, Huds. I. Marple, *Hannan*. IV. Burton-on-Trent, *Harris*. Var. *Helix*, Linn. I. Marple, *Hannan*. IV. Burton-on-Trent, *Harris*.

S. viminalis, Linn. Common.

S. Smithiana, Willd. I. Marple, *Wild*.

S. cinerea, Linn., var. *aquatica*, Auct. I. Marple, *Wild*. IV. Burton-on Trent, *Harris*.

S. aurita, Linn. I. Stirrup Wood, Charlesworth, *Whitelegg*. IV. Burton-on-Trent, *Harris*.

[*S. Caprea*, Linn. I. Marple, *Hannan*. IV. Burton-on-Trent, *Harris*; Osmaston Park, Ashbourne, *Smith*.]

S. ambigua, Ehrh. I. Mellor, *Hannan*. Var. *spathulata*, Willd. IV. Sudbury, *Harris*.

Typha latifolia, Linn. I. River Etherow, *Hannan*. IV. Burton-on-Trent, *Harris*; Willington!

T. angustifolia, Linn. IV. Rare, Morley, *Whittaker*.

Sparganium ramosum, Huds. I. Dove Dale! IV. Normanton-by-Derby! Burton-on-Trent, *Harris*.

Arum maculatum, Linn. Common.

Lemna minor, Linn. Common.

Potamogeton natans, Linn. Common.

P. perfoliatus, Linn. IV. Burton-on-Trent, *Harris*.

P. crispus, Linn. I. Dove Dale! IV. Locko Park, Derby! Burton-on-Trent, *Harris*; Repton, *Hagger*.

P. densus, Linn. IV. Repton, *Hagger*.

P. zosterifolius, Schum. IV. Drakelowe, *Harris*; Spondon!

P. pectinatus, Linn. IV. Drakelowe, *Harris*; Derby!

P. filiformis, Nolte. IV. Rare, near Ashbourne, *Smith*.

Zannichellia palustris, Linn. I. Miller's Dale, *Bailey*. IV. Egginton, *Harris*; Ockbrook!

Triglochin palustre, Linn. I. Miller's Dale, *West*.

Sagittaria sagittifolia, Linn. IV. Burton-on-Trent, *Harris*; Chaddesden!

Alisma Plantago, Linn. IV. Common.

Butomus umbellatus, Linn. IV. Burton-on-Trent, *Harris*; Derby!

Elodea canadensis, Mich. IV. Repton, *Hagger*; Burton-on-Trent, *Harris*.

Orchis pyramidalis, Linn. I. Matlock Bath, *Bailey*; Dove Dale! III. Annesley, near Mansfield, *Smith*.

O. ustulata, Linn. I. Rare, Matlock, *Whitelegg*.

O. Morio, Linn. I. Matlock Bath, *Whitelegg*. IV. Morley, *Whittaker*; Normanton-by-Derby! Burton-on-Trent, *Harris*.

O. mascula, Linn. Common.

O. latifolia, Linn. I. Monsal Dale, *Bailey*.

O. maculata, Linn. Common.

Gymnadenia conopsea, Brown. I. Wormhill, *West*; Masson, Matlock Bath! IV. Ockbrook.

Habenaria viridis, Brown. I. Buxton! Matlock Bath, *Rowlands*. III. Annesley, near Mansfield, *Smith*. IV. Foremark, *Harris*.

H. chlorantha, Bab. I. Lathkill Dale; Matlock Bath, *Whitelegg*.

Ophrys apifera, Huds. I. Matlock Bath, *Rowlands*; Monsal Dale! III. Annesley, near Mansfield, *Smith*.

O. muscifera, Huds. I. Matlock Bath! III. Annesley, near Mansfield, *Smith*.

Listera ovata, Brown. I. Buxton, *West*; Cressbrook Dale, *Hannan*; Via Gellia! IV. Burton-on-Trent, *Harris*.

Neottia Nidus-avis, Reich. I. Lathkill Dale, *Whitelegg*; Dove Dale, *Smith*.

Epipactis latifolia, Auct. I. Dove Dale! Cressbrook Dale! Chatsworth, *Harris*; Cromford, *Smith*. IV. Calke, *Purchas*.

Iris Pseudacorus, Linn. IV. Osmaston-by-Derby! Willington! Burton-on-Trent, *Harris*.

Crocus nudiflorus, Sm. IV. Derby!

Narcissus Pseudo-narcissus, Linn. I. Whatstandwell! Horsley Castle, *Whittaker*. IV. Spondon, *Smith*.

**N. poeticus*, Linn. IV. Kedleston!

Galanthus nivalis, Linn. IV. Morley, *Whittaker*; Elvaston, near Derby, *Smith*.

Tamus communis, Linn. IV. Common.

Paris quadrifolia, Linn. I. Matlock Bath, *West*; Via Gellia! IV. Burton-on-Trent, *Harris*.

Polygonatum officinale, All. I. Rare, near Ashbourne, *Purchas*.

Convallaria majalis, Linn. I. Dove Dale, *Purchas*; Lathkill Dale, *Whitelegg*; Monsal Dale! Via Gellia.

Scilla nutans, Sm. Common.

Allium vineale, Linn., var. *compactum*, Thuill. I. Castleton, *Hannan*; Dove Dale, *Purchas*. IV. Sawley, near Derby, *Smith*.

A. ursinum, Linn. IV. Burton-on-Trent, *Harris*; Breadsall; Deal Abbey Woods!

Colchicum autumnale, Linn. IV. Foremark Meadows, *Harris*; Morley, *Whittaker*; Breadsall!

Luzula sylvatica, Bich. I. Mellor, *Hannan*. IV. Repton Shrubs! Drakelowe, *Harris*.

L. campestris, DC. Common.

L. multiflora, Koch, var. *congesta*, Sm. IV. Burton-on-Trent, *Harris*; Repton Shrubs! Horsley Car!

Juncus conglomeratus, Linn. IV. Common.

J. effusus, Linn. IV. Common.

J. glaucus, Sibth. IV. Drakelowe, *Harris*; Breadsall!

J. acutiflorus, Ehrh. I. Axe Edge! IV. Spondon, *Smith*.

J. lamprocarpus, Ehrh. IV. Spondon, *Smith*.
J. supinus, Mœnch. I. Axe Edge!
J. bufonius, Linn. IV. Near Repton Shrubs!
J. squarrosus, Linn. I. Axe Edge! IV. Gresley, *Harris*.
Blysmus compressus, Panz. I. Miller's Dale, *Whitelegg*; Dove Dale!
Scirpus palustris, Linn. IV. Common.
S. cæspitosus, Linn. I. Axe Edge!
S. lacustris, Linn. IV. Burton-on-Trent, *Harris*; Swarkestone Bridge!
Eriophorum vaginatum, Linn. I. Axe Edge! Moors, N. Derbyshire, *West*.
E. angustifolium, Roth. I. Coombes Moss, Buxton! Moors, N. Derbyshire, *West*. IV. Repton Rocks!
Carex pulicaris, Linn. I. Stirrup Wood, Charlesworth, *Schofield*; Monk's Dale, *West*; Road near Harper's Hill, Buxton!
C. disticha, Huds. I. Lathkill Dale, *Whitelegg*.
C. paniculata, Linn. I. Charlesworth, *Hannan*. IV. Repton Rocks, *Harris*; Kedleston!
C. vulpina, Linn. IV. Burton-on-Trent, *Harris*; Willington! Kedleston!
C. muricata, Linn. I. Monsal Dale, *Whitehead*; Lathkill Dale, *Sunderland*. IV. Stanton-by-Bridge, *Harris*. Var. *pseudo-divulsa*. I. Lathkill Dale, *Bailey*.
C. stellulata, Good. IV. Breadsall Moor! Burton-on-Trent, *Harris*.
C. remota, Linn. I. Marple, *Wild*. IV. Egginton, *Harris*; Breadsall Moor!
C. curta, Good. I. Axe Edge, *West*.
C. ovalis, Good. I. Axe Edge, *West*; Marple, *Wild*; Dove Dale! IV. Ockbrook, *Smith*; Burton-on-Trent, *Harris*.
C. acuta, Linn. IV. Stapenhill, *Harris*.
C. vulgaris, Fries. I. Axe Edge, *West*; Marple and Miller's Dale, *Wild*. IV. Repton Rocks! Burton-on-Trent, *Harris*.
C. glauca, Scop. I. Marple and Miller's Dale, *Wild*; Matlock Bath! IV. Derby! Burton-on-Trent, *Harris*. Var. *stictocarpa*, Sm. I. Monsal Dale, *West*.
C. digitata, Linn. I. Monsal Dale, *Percival & Rogers*.
C. ornithopoda, Willd. I. Miller's Dale, discovered by the late *Mr. Rogers*; Cressbrook Dale, *Bailey*.
C. pilulifera, Linn. I. Charlesworth, *Whitehead*; Monk's Dale, *West*. IV. Burton-on-Trent, *Harris*.
C. præcox, Jacq. I. Miller's Dale and Marple, *Wild*; Dove Dale, *Rev. J. H. Thompson*. IV. Little Eaton! Burton-on-Trent, *Harris*.
C. pallescens, Linn. I. Turnditch!
C. panicea, Linn. I. Miller's Dale and Marple, *Wild*. IV. Breadsall Moor! Repton Rocks!
C. pendula, Huds. I. Mellor, *Hannan*; Ludworth, *Whitehead*; Miller's Dale and Marple, *Wild*.
C. sylvatica, Huds. I. Cressbrook Dale! IV. Burton-on-Trent, *Harris*.

C. lævigata, Sm. I. Charlesworth, *Whitelegg*; near Harwood Grange, Chesterfield, *Sutherland*.

C. binervis, Sm. I. Valley of the Goyt; Axe Edge and Castleton, *West*. IV. Burton-on-Trent, *Harris*.

C. fulva, Good. I. Stirrup Wood, Charlesworth, *Schofield*.

C. flava, Linn., var. *lepidocarpa*, Tausch. I. Charlesworth Coombes, *Schofield*; Axe Edge, *Wild*. IV. Morley Moor!

C. hirta, Linn. I. Miller's Dale, *West*; Monsal Dale, *Hannan*; Charlesworth Coombes, *Schofield*. IV. Burton-on-Trent, *Harris*.

C. paludosa, Good. I. Lathkill Dale, *Hannan & Sunderland*. IV. Burton-on-Trent, *Harris*.

C. riparia, Curtis. I. Bakewell, *West*. IV. Hilton! Willington! Repton! Burton-on-Trent, *Harris*.

C. rostrata, Stokes (*C. ampullacea*, Good.). I. Miller's Dale, *West*; Bakewell and Baslow, *Bailey*; Lathkill Dale, *Whitelegg*. IV. Burton-on-Trent, *Harris*.

C. vesicaria, Linn. I. Near Stirrup Wood, Charlesworth, *Schofield*; Miller's Dale, *West*.

Anthoxanthum odoratum, Linn. IV. Common.

Digraphis arundinacea, Trin. I. Miller's Dale, *Hannan*. IV. Breadsall! Holbrook, near Derby! Drakelowe, *Harris*.

Alopecurus agrestis, Linn. IV. Common.

A. geniculatus, Linn. IV. Breadsall! Burton-on-Trent, *Harris*.

A. pratensis, Linn. I. Dove Dale!

Phleum pratense, Linn. I. Wormhill, *West*; Dove Dale! Var. *nodosum*, Linn. I. Ashford Dale, *Hannan*; Miller's Dale, *Whitehead*; Marple, *Wild*; Dove Dale! IV. Stapenhill, *Harris*.

Agrostis alba, Linn. I. Cressbrook Dale! IV. Burton-on-Trent, *Harris*.

A. vulgaris, With. Heaths, common.

Calamagrostis Epigeios, Roth. IV. Gresley, *Harris*.

C. lanceolata, Roth. IV. Gresley, *Harris*.

Phragmites communis, Trin. IV. Drakelowe, *Harris*; Duffield!

Milium effusum, Linn. IV. Dale Abbey Woods, *Smith*; Drakelowe, *Harris*; Repton Shrubs!

Aira cæspitosa, Linn. I. Dove Dale! Ashwood Dale! IV. Burton-on-Trent, *Harris*.

A. flexuosa, Linn. I. Valley of the Goyt, Buxton! IV. Burton-on-Trent, *Harris*.

A. caryophyllea, Linn. I. Miller's Dale, *Hannan*; Horsley Car! IV. Burton-on-Trent, *Harris*.

A. præcox, Linn. I. Miller's Dale, *Hannan*. IV. Bretby Park, *Harris*.

Avena flavescens, Linn. I. Litton, *Whitelegg*; Buxton, *Wild*; Miller's Dale, *West*. IV. Burton-on-Trent, *Harris*.

A. pubescens, Linn. I. Ashford Dale, *Whitelegg*; Miller's Dale, *Hannan*; Buxton, *Wild*. IV. Willington! Burton-on-Trent, *Harris*.

A. pratensis, Linn. I. Miller's Dale, *Hannan*. IV. Burton-on-Trent, *Harris*.

A. elatior, Linn. I. Miller's Dale, *West*, IV. Willington! Stapenhill, *Harris*.

Holcus mollis, Linn. I. Valley of the Goyt, Buxton! IV. Burton-on Trent, *Harris.*

H. lanatus, Linn. IV. Common.

Triodia decumbens, Beauv. I. Valley of the Goyt, Buxton!

Koeleria cristata, Pers. I. Miller's Dale, *Wild*; Monsal Dale!

Molinia cærulea, Mœnch. I. Newhaven! IV. Shirley Woods, *Smith.*

Melica nutans, Linn. I. Cressbrook Dale, *Whitelegg*; Miller's Dale, *Wild*; Monk's Dale, *West*; Dove Dale!

M. uniflora, Retz. I. Miller's Dale; Dove Dale! IV. Burton-on-Trent, *Harris.*

Catabrosa aquatica, Beauv. I. Near Ebbing and Flowing Well, Buxton, *Purchas.*

Glyceria fluitans, Br. IV. Common.

G. aquatica, Sm. IV. Swarkestone Bridge! Willington! Burton-on-Trent, *Harris.*

Sclerochloa rigida, Link. I. Miller's Dale, *Whitelegg.*

Poa annua, Linn. Common.

P. nemoralis, Linn. I. Wormhill, *West*; Miller's Dale! IV. Burton-on-Trent, *Harris.*

P. compressa, Linn. I. Buxton, *Whitelegg.*

P. pratensis, Linn. I. Miller's Dale, *Whitelegg.* IV. Breadsall Meadows! Burton-on-Trent, *Harris.*

P. trivialis, Linn. I. Dove Dale! IV. Burton-on-Trent, *Harris.*

Briza media, Linn. Common.

Cynosurus cristatus, Linn. Common.

Dactylis glomerata, Linn. Common.

Festuca ovina, Linn. I. Valley of the Goyt, Buxton! IV. Horsley Car!

F. rubra, Linn. I. Miller's Dale, *Hannan.* IV. Burton-on-Trent, *Harris.* Var. *duriuscula*, Linn. IV. Horsley Car! Burton-on-Trent, *Harris.*

F. sylvatica, Vill. I. Stirrup Wood, Charlesworth, *Whitehead*; Ashwood Dale!

F. elatior, Linn. I. Miller's Dale, *Hannan.* IV. Burton-on-Trent, *Harris.*

F. pratensis, Huds. IV. Newhall, *Harris.*

Bromus asper, Murr. I. Stirrup Wood, Glossop, *Whitehead*! Dove Dale! Ashwood Dale! IV. Burton-on-Trent, *Harris.*

B. erectus, Huds. I. Miller's Dale, *Hannan.*

B. sterilis, Linn. I. Horsley Car! IV. Burton-on-Trent, *Harris.*

B. secalinus, Linn. I. Charlesworth, *Whitehead.*

B. mollis, Linn. IV. Common.

Brachypodium sylvaticum, R. &. S. I. Cock's Bridge, *Wild*; Cressbrook Dale, *Hannan*; Ashwood Dale! Dove Dale!

B. pinnatum, Beauv. I. Crich Stand, *Whitelegg.*

Triticum caninum, Huds. I. Matlock Bath, *Sunderland.* IV. Burton on-Trent, *Harris.*

T. repens, Linn. I. Cressbrook Dale, *Hannan*. IV. Burton-on-Trent, *Harris*.

Lolium perenne, Linn. Common.

Hordeum sylvaticum, Huds. I. Ashwood Dale, Buxton, *Babington*; Stirrup Wood, Charlesworth, *Hannan*.

H. murinum, Linn. IV, Common

Nardus stricta, Linn. I. Coombe's Moss, Buxton! IV. Linton Heath, *Harris*.

Pteris aquilina, Linn. Common.

Lomaria Spicant, Desv. I. Axe Edge! IV. Repton Shrubs, *Harris*.

Asplenium Ruta-muraria, Linn. Common.

A. Trichomanes, Linn. I. Dove Dale! IV. Derby, common!

A. viride, Huds. I. Very rare! Nearly extinct.

A. Adiantum-nigrum, Linn. IV. Anchor Church, near Repton, *Harris*.

Athyrium Filix-fœmina, Bernh. Common.

Ceterach officinarum, Willd. I. Very rare! Nearly extinct.

Scolopendrium vulgare, Sm. Common.

Cystopteris fragilis, Bernh. I. Common on limestone.

Aspidium aculeatum, var. *lobatum*, Sw. I. Mellor, *Hannan*; Wormhill and Chee Dale, *West*; Peak Forest!

A. angulare, Willd. I. Rare, *Hannan*.

Nephrodium Filix-mas, Rich. Common.

N. spinulosum, Desv. IV. Repton Shrubs and Foremark, *Harris*; Repton Rocks!

N. dilatatum, Desv. IV. Common.

N. Oreopteris, Desv. I. Kinder Scout, *Bailey*; Matlock Bath, *Smith*. IV. Repton Shrubs, *Harris*.

Polypodium vulgare, Linn. Common.

P. Phegopteris, Linn. I. Rare!

P. Dryopteris, Linn. I. Rare!

P. Robertianum, Hoffm. I. Miller's Dale, *Wild*; near Buxton! Via Gellia!

Ophioglossum vulgatum, Linn. I. Burbage, *Wild*. IV. Morley, *Whittaker*; Derby!

Botrychium Lunaria, Sw. I. Charlesworth, *Whitehead*; Monk's Dale and Matlock Bath, *Wild*. IV. Foremark, *Harris*.

Lycopodium clavatum, Linn. I. Stenior Clough, *Hannan*.

Equisetum arvense, Linn. Common.

E. sylvaticum, Linn. I. Horsley Car!

E. palustre, Linn. I. Miller's Dale, *West*; Axe Edge! Dove Dale! IV. Osmaston-by-Derby!

E. limosum, Linn. IV. Gresley, *Harris*; Breadsall! Osmaston-by-Derby!

N.B.—The name of Mr. Whitehead, Dukinfield, was inadvertently omitted from the list of those who have assisted in the compilation of the foregoing notes.

ON *ERYTHRÆA CAPITATA*, Willd., *var. SPHÆROCEPHALA*.

By F. Townsend, M.A., F.L.S.

Two summers have passed since the attention of botanists was first called to the Freshwater *Erythræa* in the pages of this Journal for 1879 (p. 327), and I have since described this plant as *Erythræa capitata* var. *sphærocephala* (Journ. Bot. 1881, p. 87, and Journ. of Linn. Soc., June, 1881). Unfortunately I have been unable to visit the locality again during the flowering season, but this year I have seen it in excellent fruit, and have secured a collection of fruit specimens for distribution.

The plant is at this date—August 27th—quite past flowering. I expect the hot weather we had in June last, and again later on, has this year hastened the flowering time, which has consequently been of shorter duration than usual. It grows in plenty in the sunniest and most exposed situations on the southern side of the downs, where the turf is shortest and sweetest, thus causing specimens of luxuriant growth to be liable to be cropped by sheep, and from one or the other or both reasons, viz., exposure and cropping, the plant more usually grows so low and stunted that it does not even rise above the height of the excessively short herbage of these downs. Only when protected by low gorse, of which there are a few patches, does an occasional plant rise to the height of more than about a quarter to one inch. In less exposed spots the species might commonly attain the height of the tallest specimen I have gathered, the stems of which, four in number, arising from the crown of the root, are about three inches high, and are overtopped by the long naked stalked secondary flowering tufts which are so peculiarly characteristic of the species.

In fruit the species is very easily distinguished from *E. Centaurium*, *E. littoralis*, or *E. pulchella*. The corolla-tube of *E. capitata* does not grow and lengthen with the growth of the ovary after flowering. At the time of flowering a portion of the ovary is already exserted beyond the mouth of the corolla-tube, and the capsule, when ripe, has only its lower two-thirds covered by the marcescent corolla-tube, the upper third of the capsule being naked. The corolla-tube is not narrowed at the top, either in flower or in fruit; indeed it could not be, because both the ovary and the capsule extend and protrude beyond the mouth of the tube, thus preventing any narrowing. In the other species just named the corolla-tube grows and lengthens with the growth of the ovary, which is included within the corolla-tube at the time of flowering, and the capsule, when ripe, is also wholly included; the corolla-tube is narrowed over the top of the ovary, and even more evidently over the top of the capsule, above which sit the shrivelled corolla-segments.

I have not been able to ascertain whether *E. capitata* is still to be found on the downs of Newhaven, but its occurrence there led

me to think that it might be found about Beachy Head and Eastbourne, and Mr. Roper, author of 'The Flora of Eastbourne,' has kindly examined his herbarium, and has shown me three specimens of *E. capitata* var. *sphærocephala*, very small and stunted, gathered by him on the downs of that neighbourhood; thus the range of the species is already considerably extended.

A SYNOPSIS OF THE GENUS *PITCAIRNIA*.

By J. G. Baker, F.R.S.

(Concluded from p. 273.)

51. P. Sprucei, Baker.—Leaves 6–10 to a rosette, with an oblong-lanceolate chartaceous lamina 6–8 in. long, 16–20 lines broad at the middle, acute, cuneate at the base, green and glabrous on both surfaces, with a distinct petiole half a foot long edged with a few spines. Peduncle slender, 6–8 in. long, with several small lanceolate bract-like leaves. Raceme simple, very lax, about half a foot long; pedicels erecto-patent, the lower $\frac{1}{3}$–$\frac{1}{2}$ in. long; bracts lanceolate, $\frac{1}{2}$–1 in. long. Sepals lanceolate, glabrous, $\frac{3}{4}$ in. long. Petals bright red, twice as long as the sepals. Genitalia included. —Barra do Rio Negro, *Spruce*, 1653! We have had the same or a nearly-allied species in cultivation at Kew for some time, but it has never flowered.

52. P. undulata, Schiedw. in Otto & Dietr. Allgem. Gartenzeit. x. 275; Regel Gartenflora, t. 781; Flora des Serres, t. 162.—*Lamproconus undulatus*, Lemaire in Jard. Fleur. sub t. 127.—*P. speciosissima*, Hort.—Produced leaves obovate-oblong, a foot or more long, 4–5 in. broad above the middle, thin but firm in texture, cuneate at the base, green and naked on the face, finely white-furfuraceous on the back, with a distinct unarmed petiole 6–8 in. long. Peduncle a foot long, with 5–6 adpressed erect small lanceolate leaves. Raceme simple, a foot long, lax in the lower half; rachis bright red, nearly naked; pedicels erecto-patent, $\frac{1}{4}$–$\frac{1}{2}$ in. long; bracts lanceolate, as long as the pedicels. Sepals lanceolate, nearly glabrous, seven-eighths to one inch long. Petals bright red, more than twice as long as the petals, scaled at the base. Stamens as long as the petals. Stigma finally protruded.—A fine plant, well known in cultivation, said to be Brazilian, of which I do not know the precise locality. My description is taken from a specimen that flowered at Kew in July, 1877.

53. P. vallisoletana, Lex. et La Llave Nov. Veg. Descr. i, 19. —About a foot high. Leaves ensiform, very narrow, prickly. Flowers spicate. Bracts ovate, amplexicaul, bright red. Petals rose-red, twice as long as the calyx, not scaled at the base.—Mexico.

54. P. puberuliflora, A. Rich in Sagra Fl. Cuba, iii. 262.—Leaves lanceolate, 2–3 ft. long, 2–2½ in. broad, the edge entire or subspinulose. Stem 3 ft. long. Flowers sessile, in dense horizontal

or pendent panicled spikes; bracts ovate-acuminate, nearly as long as the flowers.—Cuba.

55. P. PUNICEA, Lindl.; K. Koch, Mon. 8.—*Pepinia punicea*, A. Brogn.—Caulescent, with a short stem below the lax rosette of leaves. Whole plant about a foot high. Proper leaves 20–30, spread over 3–4 inches of the stem, linear, not distinctly petioled, about a foot long, under ½ in. broad at the middle, very acuminate, minutely spine-edged in the upper part, green and glabrous on the face, with a broad paler central band, white-furfuraceous on the back. Peduncle very short. Raceme lax, simple, 4–6 in. long; rachis thinly floccose; pedicels erecto-patent, the lower ½–¾ in. long; bracts lanceolate, as long as the pedicels. Sepals lanceolate, slightly floccose, ½–⅝ in. long. Petals bright red, 1½–1¾ in. long. Stamens and style included.—Mexico, in the province of Tabasco, *Linden*, 1159.

56. P. APHELANDRÆFLORA, Lemaire in Ill. Hort. xvi. Misc. 90.—*Pepinia aphelandræflora*, André in Linden Ill. Hort., n. s., 32, t. 5.—Stems slender, simple, reaching a foot in length below the rosette of leaves. Leaves 30–60, extending over 3–6 in. of stem, linear, sessile, about ½ ft. long, under ½ in. broad at the middle, green on both surfaces, minutely serrulate. Flowers in a dense oblong subspicate raceme 4–6 in. long in the centre of the leaves; lower bracts linear, leaf-like, 2–3 in. long; upper deltoid, brown-furfuraceous, ½–¾ in. long. Sepals coral-red, glabrous, lanceolate, ½–⅝ in. long. Sepals bright red, 2½ in. long, scaled at the base. Stamens and stigma considerably exserted.—Para, *Baraquin*. Introduced into cultivation by Linden about 1867. My description is from a specimen that flowered at Kew in 1877.

57. P. FERRUGINEA, Ruiz et Pavon Fl. Peruv. iii. 36.—*P. asterotricha*, Poeppig et Endlich. Nov. Gen. t. 158.—*Puya grandiflora*, Hook. in Bot. Mag., t. 5234.—Whole plant 10–12 ft. high. Stems 3–4 ft. long below the rosette of leaves, as thick as a man's arm, and sometimes forked. Leaves perhaps 100 in a very dense rosette, lanceolate, sessile, 2–3 ft. long, 1½–2 in. broad, horny in texture, channelled all down the green naked face, the back densely white-lepidote, the margins prickly all the way down, the lower spines brown, lanceolate, uncinate, ¼ in. long, the upper growing gradually smaller. Peduncle 2–3 ft. long below the inflorescence. Racemes up to 10–12, secund, arranged in an ample deltoid panicle, the lower branches of which are 2–3 ft. long; rachises brown-tomentose; lower pedicels 2–3 in. long; bracts oblong-navicular, scariose, shorter than the pedicels. Sepals lanceolate, densely ferrugineo-tomentose externally, 2–2½ in. long. Petals white, twice as long as the sepals, each with two large scales at the base, twisting up spirally as they fade. Stamens and style rather shorter than the petals.—Andes of Peru, *Pavon! Cuming*, 976! *Maclean!* A very fine species. The giant of the genus, and far more like a *Puya* than an ordinary *Pitcairnia* in habit. The locality of Mexico, given in Bot. Mag., is doubtless a mistake.

58. P. VIRESCENS, K. Koch, Monog. 4.—*Puya virescens*, Hook. in Bot. Mag., t. 4991.—*Pitcairnia viridiflora*, Regel, Ind. Sem. Petrop.,

1866, 81.—Acaulescent. Leaves lanceolate, not petioled, 1½–2 ft. long, 1½–2 in. broad, green and glabrous on both surfaces, free from prickles. Peduncle 2 ft. long, the leaves passing gradually into bracts. Raceme simple, subspicate, 6–8 in. long, 4–5 in. broad when expanded; bracts ovate, yellowish green, reaching to the top of the calyx. Sepals pale green, naked, 1–1¼ in. long. Petals pale yellowish green, twice as long as the sepals, scaled at the base. Stamens and style rather shorter than the petals.—Venezuela. Introduced into cultivation in 1857.

59. P. MAIDIFOLIA, Decne. in Flore des Serres, t. 915.—*Puya maidifolia*, Morren in Ann. Hort. Soc. Gand v. 453, t. 289.—Acaulescent. Leaves lanceolate, petioled, green on both sides, 2–3 ft. long, 1½–2 in. broad, without prickles. Peduncle leafy, 1½–2 ft. long. Raceme simple, subspicate, nearly a foot long, lax towards the base; bracts oblong-deltoid, 1¼–1½ in. long, reddish, with green tips. Sepals naked, above an inch long. Petals greenish-white, 1½ in. longer than the sepals. Stamens and style not protruded.—San Cristobal, Venezuela, alt. 4000 ft., *Funk & Schlim.*

60. P. ZEIFOLIA, K. Koch, Monogr., 4; Baker in Bot. Mag. t. 6535.—Acaulescent. Leaves with an unarmed channelled petiole ½ ft. long and a lanceolate entire lamina 2–3 ft. long, 2–2½ in. broad at the middle, green and naked on both surfaces. Peduncle 1–2 ft. long, leafy, nearly glabrous. Raceme subspicate, reaching 1–1½ ft. long, 3 in. diameter when expanded; bracts oblong-navicular, reddish-yellow, 1–1½ in. long. Sepals oblong-lanceolate, greenish, naked, ¾–1 in long. Petals nearly white, more than twice as long as the sepals. Style and anthers reaching to the tip of the petals.—Guatemala, *Warcewicz*. Santa Martha, *Purdie!*

61. P. FUNKIANA, A. Dietr. in Otto et Dietr. Allgem. Gartenzeit. xix. 337; Regel, Gartenfl. t. 113.—*Phlomostachys Funkiana*, Beer Brom. 47.—*Pitcairnia macrocalyx*, Hook. in Bot. Mag. t. 4705.—Leaves with an unarmed petiole ½–1 ft. long and a lanceolate entire lamina 2–3 ft. long, 2–2½ in. broad at the middle, green and glabrous on both surfaces. Peduncle slightly pubescent, 2 ft. long, its lower leaves large. Raceme subspicate, ½–1 ft. long; lower pedicels sometimes ¼–⅓ in. long; bracts ovate-acuminate, yellowish green, 1–1¼ in. long. Sepals lanceolate, glabrous, an inch long. Petals nearly white, more than twice as long as the calyx. Stigma finally exserted.—Venezuela, *Funck*. Santa Martha, *Purdie!* British Guiana, *Sir R. Schomburgh!*

62. P. RECURVATA, K. Koch, Mon. 4.—*Puya recurvata*, Schiedw. in Otto et Dietr. Allgem. Gartenzeit. x. 275.—*Pitcairnia polyanthoides*, A. Brong.—Acaulescent or shortly caulescent. Produced leaves 10–12 to a stem, with an unarmed channelled petiole ½ ft. long and a lanceolate lamina 2 ft. long, 12–21 lin. broad, minutely serrulate towards the tip, green and naked above, white-furfuraceous beneath. Peduncle 1½–2 ft. long, furfuraceous, all its leaves small and bract-like. Raceme dense, subspicate, simple, 4–6 in. long, 4 in. diam. when expanded; bracts oblong-deltoid, brownish, 1–1½ in. long. Sepals lanceolate, greenish, ⅞–1 in. long. Petals milk-white, 3–3½ in. long, much decurved, minutely scaled at the

base. Anthers and stigma not exserted.—For this I do not know the precise station. My description is taken from a plant that flowered at Kew in June, 1877.

63. P. OCHROLEUCA, Baker.—*Neumannia ochroleuca*, K. Koch et Bouché, Ind. Sem. Berol. 1856, 2.—Acaulescent. Produced leaves ensiform, not distinctly petioled, 2–3 ft. long, 2 in. broad at the middle, distinctly costate, acuminate, green and glabrous on both surfaces, minutely spine-edged towards the base. Peduncle terete, naked, nearly as long as the leaves. Raceme subspicate, a foot long, simple; bracts oblong-deltoid, acuminate, greenish brown, 1½–2 in. long. Sepals an inch long, lanceolate, naked. Petals pale yellow, twice as long as the sepals, not scaled at the base. Genitalia not protruded.—Volcan de Fuego, Guatemala, alt. 3800 ft., *Salvin!*

64. P. RHODOSTACHYS, Hassk. in Retzia, ii. 8.—Produced leaves ensiform, distinctly petioled, 3–4 ft. long (petiole included), 2–2½ in. broad at the middle, very acuminate, green and glabrous above, white-furfuraceous beneath. Peduncle leafy, 1½–2 ft. long. Raceme simple, subspicate, 8–9 in. long, 1½ in. diam.; bracts red, oblong or ovate-oblong, 1½–2 in. long. Sepals lanceolate, naked, reddish yellow. Petals whitish, twice as long as the sepals, not scaled at the base. A garden plant known to me from description only.

65. P. ALTENSTEINII, Lemaire in Flore des Serres, t. 162.—*Puya Altensteinii*, Klotzsch in Link, Klotzsch et Otto Ic. t. 1.—*Lamproconus Altensteinii*, Lemaire in Jard. Fleur. sub t. 127.—*Phlomostachys Altensteinii*, Beer Brom. 45.—*Neumannia Altensteinii*, Griseb. in Gott. Nacht. 1864, 14.—*Pitcairnia undulatifolia*, Hook. in Bot. Mag. t. 4241.—Acaulescent. Produced leaves about 10 to a stem, with an unarmed or minutely prickly channelled petiole ½–1 ft. long and an ensiform entire lamina 2–3 ft. long, 1½–2 in. broad at the middle, green and naked on both surfaces. Peduncle 1–1½ ft. long, stout and stiffly erect, hidden by its many sheathing erect glabrous reduced leaves. Raceme simple, subspicate, 4–6 in. long., 2 in. diam.; bracts bright red, oblong-navicular, glabrous, 1½–2 in. long. Sepals lanceolate, glabrous, 1–1¼ in. long. Petals whitish, twice as long as the sepals. Stamens and stigma reaching to the tip of the petals.—Mountains of Western Venezuela, alt. 2500–3000 ft., *Moritz; Fendler*, 1529!

Phlomostachys gigantea, Beer Brom. 47 (*Puya Altensteinii*, var. *gigantea*, Hook. in Bot. Mag. t. 4309—*Pitcairnia Altensteinii*, Lemaire in Flore des Serres, t. 253, 254), is a giant variety of this species with an inflorescence 6–7 feet high, peduncle included.

66. P. WENDLANDI, Baker.—*Puya sulphurea*, Wendl.; Hook. in Bot. Mag. t. 4696.—*Phlomostachys sulphurea*, Beer Brom. 46.—*Neumannia sulphurea*, K. Koch, Ind. Sem. Berol. 1856, 2.—Acaulescent. Produced leaves with a distinct unarmed petiole nearly a foot long and an entire ensiform lamina 2–3 ft. long, 2–3 in. broad at the middle, green and glabrous on both surfaces. Peduncle closely leafy, 2 ft. or more long, stout and stiffly erect. Raceme simple, subspicate, ½–1 ft. long, 2 in. diam.; bracts

ovate-deltoid, glabrous, purplish red or greenish towards the tip, much imbricated, 1½–2 in. long. Sepals lanceolate, naked, 1 in. long. Petals sulphur-yellow, scaled at the base, more than twice as long as the sepals. Anthers and stigma not produced.—Introduced into cultivation about 1853; the exact country not known.

67. P. IMBRICATA, Baker.—*Neumannia imbricata*, A. Brong. in Ann. Sc. Nat. ser. 2, xv. 362.—*Phlomostachys imbricata*, Beer Brom. 47.—Acaulescent. Leaves 12–20 to a stem, with a petiole ½–1 ft. long, armed with small deflexed horny brown prickles and an ensiform lamina 1½–2 ft. long, 1½–2 in. broad at the middle, green and glabrous on both surfaces. Peduncle a foot long, closely leafy. Raceme simple, subspicate, finally a foot or more long, 2 in. diam.; bracts greenish, oblong-acuminate, 1½–2 in. long. Sepals lanceolate, very glutinous, an inch long, whitish, tipped with green. Petals cream-white, lingulate, more than twice as long as the sepals, not scaled at the base. Anthers and stigma not protruded.—Mexico, *Andrieux*. Valley of Cordova, *Bourgeau*, 1778! My description is mainly taken from a plant that flowered at Kew in October, 1879.

68. P. ATRORUBENS, Baker.—*Phlomostachys atrorubens*, Beer Brom. 48.—*Neumannia atrorubens*, K. Koch, Ind. Sem. Berol. 1856, App. 3.—*Puya Warcewiczii*, Wendl.; Hook. in Bot. Mag. t. 5225.—Produced leaves with a spine-edged petiole 3–6 in. long and a lanceolate lamina 2–3 ft. long, 2–3 in. broad at the middle, green and naked on both surfaces. Peduncle stout, erect, leafy, shorter than the leaves. Raceme simple, subspicate, 6–8 in. long, 2½–3 in. diam.; bracts bright red, acuminate, oblong-navicular, much imbricated, 2–2½ in. long. Sepals lanceolate, glabrous, under an inch long. Petals pale yellow, lingulate, 2½–3 in. long, scaled at the base. Anthers and stigma not protruded.—Mountains of Chiriqui, Central America, *Warcewicz*.

69. P. PETIOLATA, Baker.—*Neumannia petiolata*, K. Koch et Bouché, Ind. Sem. Hort. Berol. 1856, App. 2.—Produced leaves with a distinct petiole 1½–2 ft. long, edged with small decurved blackish prickles and an ensiform lamina 3–4 ft. long, 1½–2 in. broad, green and naked on both surfaces. Peduncle stout, erect, leafy, 1½–2 ft. long, ½ in. diam. at the top. Raceme simple, subspicate, 1½–2 ft. long, 2 in. diam.; bracts much imbricated, oblong-deltoid, acuminate, glabrous, greenish brown, 2–2½ in. long, 1 in. broad at the base. Sepals lanceolate, glabrous, an inch long. Petals greenish-yellow, more than twice as long as the sepals, scaled at the base. Stamens and pistil shorter than the petals.—Guatemala, *Warcewicz*. Described from K. Koch's garden specimen.

70. P. DENSIFLORA, A. Brong. in Hort. Univ. vi. 228, *cum icone*. —*P. aurantiaca*, Tenore in Ann. Sc. Nat. Ser. 4, ii. 378.—Acaulescent. Produced leaves with an unarmed channelled petiole ½ ft. long and an ensiform entire lamina 2–3 ft. long, 1¼–1½ in. broad at the middle, green and glabrous on both surfaces. Peduncle 1–2 ft. long, leafy, furfuraceous upwards. Raceme very dense, simple, subspicate, oblong, 3–4 in. long, 1½ in. diam.; bracts deltoid, much imbricated, greenish, naked, 1¼–1½ in. long. Sepals pale

green, lanceolate, glabrous, under an inch. Petals bright yellowish red, twice as long as the sepals. Stamens and stigma reaching up to the tip of the petals.—A garden plant of which I do not know the exact station. It differs from all the other *Neumannias* by its bright-coloured flowers.

ON THE PRODUCTION OF HYBRIDS IN THE GENUS *EPILOBIUM*.

By T. R. Archer Briggs, F.L.S.

Observations for many years past of the *Epilobia* growing about Plymouth have convinced me that hybrids are frequently produced between several of the species of this genus, and I mentioned the subject in my 'Flora of Plymouth' (p. 154*). Sometimes the hybrid nature of a plant has been clearly manifest; for instance, when such a strikingly dissimilar species as *E. parviflorum* has partially stamped its features on a hybrid production. From the less obvious differences between *E. montanum* and *E. lanceolatum*, or *E. lanceolatum* and *E. obscurum*, admixtures between these have not always as clearly shown their parentage.

Some botanists seem anxious to ignore as much as possible the fact of natural hybrids being produced; still if they find themselves obliged to admit that they are certainly found in some genera, such as *Carduus* and *Verbascum*, they clearly cannot deny the possibility, or even probability, of their being discovered in certain others also. Many years ago Schultz called attention to plants which he considered to be the offspring of *Epilobium obscurum* and *E. palustre*, and of *E. montanum* and *E. palustre*.

This past summer I have been so fortunate as to meet with a hybrid between the strikingly dissimilar species, *E. hirsutum* and *E. montanum*. It formed a patch, with many stems from the root, on top of a hedge-bank by a damp lane at Shalaford, Egg Buckland, South Devon, about four miles from Plymouth, and was growing near both *E. hirsutum* and *E. montanum*. The following is a brief description of this plant:—Root-stock apparently somewhat creeping from the number of the stems; stem round, 2–3 ft. high, upper part with woolly hairs; leaves lanceolate, serrate, sessile; buds nodding or erect; flowers as large again as *E. montanum*, deep purple. Differs from *E. hirsutum* in the much more glabrous surface of the whole plant, the broader and shorter leaves, smaller flowers, and partially nodding flower-buds. Differs from *E. montanum* in the habit of growth, many stems proceeding from the root-stock; in the more branched and more hairy stem; longer, narrower, and more sharply serrate leaves; larger flowers, of a deeper purple in colour; and in the downy or shortly hairy pods.

It was in full flower at the beginning of the month of August, when I found it. I forward a couple of specimens for the Herbarium of the British Museum.

---

* [See also 'Journ. Bot.,' 1880, p. 284.—Ed. Journ. Bot.]

THE DATES OF PUBLICATION OF THE VARIOUS PARTS OF CURTIS'S 'FLORA LONDINENSIS.'

By B. Daydon Jackson, Sec. L.S.

In the following remarks I can claim little merit but editorial, the entire working out of the subject—one of the last on which he was engaged—having been accomplished by our deceased friend Alfred Reginald Pryor.*

The issue of Curtis's 'Flora Londinensis' was long protracted; the parts were issued at uncertain intervals, sometimes very wide apart; the work did not pay its expenses, and its progress was compared to a funeral. I tried some time ago to discover the order in which the plates were issued, only the later plates being dated, and the very earliest not having even a number to mark their sequence. All the copies known to me had been arranged by the binder in the order indicated in the index to each fasciculus of twelve numbers, a plan which, however good when the Linnean system was dominant, is awkward at the present time, the more so when it is remembered that six fasciculi have to be consulted, and each is so arranged. After some time vainly spent in this research, I gave it up in despair, thinking it as little within reach as the somewhat similar case of Jacquin's 'Stapeliarum Descriptiones.'

The task I failed in, was accomplished by our late friend by an ingenious and painstaking elaboration of all the references to Curtis, which are extant in the following contemporaneous Floras:—

Lightfoot's 'Flora Scotica,' 1777.

Withering's 'Botanical Arrangement of British Plants,' ed. 2, 1787–92. References by Dr. Stokes. Much used.

Sibthorp's 'Flora Oxoniensis,' 1794. Next to the preceding in usefulness.

Relhan's 'Flora Cantabrigiensis,' 1785. Not much used, no specific references being given by the author.

Hudson's 'Flora Anglica,' ed. 2, 1778, does not cite Curtis, owing to some feud between the two authors; the absence of citation is emphasised by Lightfoot's Flora being extensively quoted, itself published after the completion of the first fasciculus of the 'Flora Londinensis.'

From these chief sources, with an occasional reference to others for single points, a full list was drawn up by Mr. Pryor, who had intended to summarise its contents for publication. But before he could do so he was taken from us; and his list, from which the following summary has been drawn, has been placed in my hands for that purpose by the Editor of this Journal.

---

* He is better known as a correspondent of this Journal under the name of Reginald A. Pryor, an inversion adopted to prevent confusion of himself and his father, both possessing the same names.

Vol. I.

Fasc. 1.—The first number was issued in May, 1775, according to a MS. of Pulteney seen by Mr. Pryor, but which I have not been able to verify; the date is presumably correct, for we know the first fasciculus was complete by the time Lightfoot's preface was written, July 24th, 1777 (see also 'Fl. Scotica,' pp. 1149–1151). The date given by Stokes in 'Withering,' 1776, is certainly a mistake; from the preface to the first fasciculus it is evident at least six weeks, if not longer, elapsed between the issue of each part; if two months on an average, that would amount to two years, thus coinciding with the date derived from Pulteney's MS. Smith, in Rees's 'Cyclopædia,' art. "Curtis," says 1777; but that is the date on the title-page, and marks the conclusion, not the beginning, of the publication.

Plate 10, in fasc. 2, is the first to bear a number.

Vol. II.

No. 47, in fasc. 4, referred to by Curtis in his 'Catalogue of Settle Plants,' in 1782.

No. 50, in fasc. 5, the last quoted by Relhan in May, 1785.

No. 58, in fasc. 5, the last quoted by Stokes, August, 1787.

No. 59, in fasc. 5, the numbers on the plates cease, November, 1788. 'Pulteney MS.'

No. 64, in fasc. 6, January, 1, 1791, on the plate.

No. 65, in fasc. 6, March 1, 1791, on the plates; issued June, 1791, according to 'Pulteney MS.'

No. 66, in fasc. 6, December, 1791; June, 1792, 'Pulteney MS.'

No. 67, in fasc. 6, 1793, 'Pulteney MS.'; "67 numbers," Sibthorp, 'Fl. Oxon.,' p. xvi., 1794.

No. 69, in fasc. 6. Published between Sept. 1, 1794, and July 1, 1795; *Helleborus viridis* in 'English Botany' of the former date has no reference to Curtis, whilst *Antirrhinum Peloria* at the latter has. The letterpress to this plant speaks of "this summer 1794 in the beginning of August." This fasciculus is the last quoted by Stokes in 'Withering,' vol. iii., 1796.

No. 72, in fasc. 6. Published between January 1, 1797, and the end of 1798. *Pulmonaria maritima* in 'English Botany' of that date does not cite Curtis. See also under *Lobelia urens*, "October 18, 1796," referred to as "two years since."

THE LATE FREDERICK CURREY, M.A., F.R.S.

Another name has to be added to the roll of English botanists recently removed by death; Frederick Currey died on Thursday, September 8th, 1881. He was born at Eltham, in Kent, August 19th, 1819, his father, Mr. Benjamin Currey, being Clerk of the Parliaments. He received his education at Eton and Trinity

College, Cambridge, where he obtained a scholarship, took his B.A. degree in 1841, and proceeded to M.A. in 1844. In that year he was called to the Bar, and thereafter practised as conveyancer and equity draughtsman.

His earliest work on scientific subjects appears to have been a translation of Schacht's 'Das Mikroskop,' which was issued in 1853, and so well received as to call for a second edition two years later. In 1854 he contributed a paper to the 'Microscopical Journal' on two new Fungi, and in the fifth volume of the 'Phytologist' were printed some observations on the "Fungi of the neighbourhood of Greenwich." The 'Microscopical Journal' about this time contains several papers on the more obscure points in the life-history of cryptogams and local botany.

The Greenwich Natural History Club, established in 1852, had appointed a committee to draw up a report on the flora of the neighbourhood. Mr. Currey was chosen chairman, and drafted the report, which was printed as an octavo pamphlet early in 1858, in which 395 Fungi were enumerated. The title runs, 'On the Botany of the district lying between the Rivers Cray, Ravensbourne and Thames.'

In the first volume of the 'Journal of the Linnean Society' he described the development of *Sclerotium roseum*, Kneiff., which was named by the Rev. M. J. Berkeley *Peziza Curreyana*. In 1856 he was elected Fellow of the Linnean Society; in 1857 he communicated an account of the existence of amorphous starch in a Tuberaceous fungus to the Royal Society, followed by his being elected into that Society in 1858. On the retirement of Mr. J. J. Bennett, in 1860, from the secretariat of the Linnean Society, Mr. Currey was chosen as his successor, and continued in that office until 1880, when he relinquished it to undertake the less exacting duties of treasurer, which position he held at the time of his death.

In 1859 he undertook his most extensive work in the shape of a translation, with considerable additions by the author, of Hofmeister's 'Verzleichende Untersuchungen ueber der . . . hoeherer Kryptogamen.' This was published in 1862 by the Ray Society, under the title 'On the germination, development, and fructification of the higher Cryptogamia, etc.' This was quickly followed by his edition of Dr. Badham's 'Esculent Funguses of England' in 1863, in which he restricted himself to corrections and bringing the work down to date. Several communications will be found in the Journal and Transactions of the Linnean Society, which are set out in the 'Catalogue of Scientific Papers.' Amongst them we may name 'Notes on British Fungi' in 1864, and his last contribution, 'On a collection of Fungi made by Mr. Sulpiz Kurz,' 1876. With Daniel Hanbury he prepared 'Remarks on *Sclerotium stipitatum*, Berk. & Curr.,* *Pachyma Cocos*, Fries, and some similar

* There was no joint communication to the Society, as might be inferred from this, but the authority is given in one of Berkeley's own papers.

productions,' 1862; and, with Dr. Welwitsch, 'A description of the Fungi collected by Dr. F. Welwitsch in Angola during the years 1850–61' (1870).

The latest production of his pen was issued last spring in the Report of the West Kent Natural History, Microscopical, and Photographic Society, an association which had absorbed the Greenwich Natural History Club before mentioned. The paper is entitled 'On some useful and noxious Fungi'; it is a popular *résumé* of well-known facts, but is of interest as testifying to his abiding interest in local Natural History. He was President of this Society from 1870 to 1872.

For some years he had considered his health precarious; but only a short time before his death, from an affection of the liver, was any alarm felt by his family. He died at Blackheath, and was buried at Weybridge, 13th September, 1881, where his wife had been interred some years before. His collection of Fungi, by his express desire, will be added to the Herbarium of the Royal Gardens, Kew.

Mr. Currey's long official connection with the Linnean Society had given rise to a large circle of friends, whilst his ever kind and genial manner had attached them to him by close ties of esteem. By all, his loss will be felt as that of a personal friend, an officer of large experience whose place it will be difficult to fill.

B. Daydon Jackson.

SHORT NOTES.

Irish Potamogetons.—*Potamogeton mucronatus*, Schrad. In the 'Cybele Hibernica' the authors notice the records of this plant under the name of *compressus*, but say they have seen no specimens. Mr. D. Orr, of Dublin, kindly sent me, a few days since, a packet of Potamogetons gathered many years ago, and among them there is a specimen of *P. mucronatus* labelled "River Bann, Co. Down, 1844, D. Orr," this being one of the stations mentioned in the 'Cybele' from 'Flor. Hib.'—*P. trichoides*, Cham. There is a specimen of this species in the same collection labelled "Pools, Conlig Hills, Co. Down, 1844, D. Orr." It is an interesting addition to the Irish flora.—*P. Zizii*, M. & K. Among some Potamogetons kindly sent me by Mr. Stewart, of Belfast, is a specimen of this plant, with the following locality on his ticket:—"Slow stream, Carrick, Co. Fermanagh, August, 1880." This is, I think, its first record as an Irish plant. It will be in District 10 of the 'Cybele Hibernica.'—Arthur Bennett.

Leontodon hastilis, L.—Dr. Boswell, in 'English Botany,' ed. 3, vol. v., p. 133, appends to his account of *Leontodon hispidus*, L., the following statement:—"This plant is a sub-species of the *L. proteiformis* of Villars, the typical form of which is the *L. hastilis* of Linnæus, which is nearly or perfectly glabrous; but, though

common on the Continent, this form has not been observed in Britain." On the 18th of August last, I met with a very few plants of a *Leontodon* in a meadow by the Avon, at Diptford, South Devon, which at first much puzzled me, as although their appearance generally was that of the *Leontodon hispidus*, L., they yet lacked the long hairs I had always seen on this species, being either quite glabrous or else having only very short hairs. On turning to Boreau's 'Flore du Centre de la France' I found them to agree with his description of *Leontodon hastilis*, the plant referred to by Dr. Boswell in the words quoted above. I now do not doubt their being this, though probably existing in the meadow where I found them only as an introduction, brought with foreign grass or clover-seeds. This supposition is strengthened by their being associated there with *Plantago media*, a species unknown elsewhere in the neighbourhood, and also with the certainly alien *Trifolium hybridum*. Possibly, however, now this plant has been introduced it will become established in the locality, as others of the order, *Crepis taraxacifolia* and *C. biennis*, have done elsewhere in Devon. —T. R. Archer Briggs.

Extracts and Notices of Books and Memoirs.

*ON THE COLOURS OF SPRING FLOWERS.**

By Alfred W. Bennett, M.A., B.Sc., F.L.S.

This paper was an attempt to explain the prevalence of certain colours in spring flowers, as contrasted with those of autumn and summer. The common spring flowers of England were reckoned as 64, and these were included, as regards colour, under five heads, *viz.*, (1) white, (2) green, (3) yellow, (4) red and pink, (5) blue and violet. The proportion was found to be as follows:—white 26, or 40·5 p.c.; green 9, or 14·1 p.c.; yellow 13, or 20·3 p.c.; red and pink 5, or 7·8 p.c.; blue and violet 11, or 17·4 p.c. The chief feature in this table is the great preponderance of white, as compared with other times of the year; yellow is also greatly in excess, while the number of red and pink flowers is extremely small. Taking now 50 early spring Swiss flowers, the following list is obtained:—white 18, or 36 p.c.; green 1, or 2 p.c.; red and pink 10, or 20 p.c.; blue and violet 8, or 16 p.c. The chief points of contrast in this list, as compared with the first, are the smaller proportion of white and green, and the very much larger proportion of red and pink. White and green differ from all the other shades as indicating rather the absence than the presence of colour. Seeing, therefore, that the bright-coloured fluid pigments of petals are formed only under the influence of a sufficient supply of light and heat, the large proportion of green and white in our early spring flowers is easily accounted for.

* Abstract of a Paper read on September 2nd, 1881, at the Meeting of the British Association at York.

Then with regard to yellow, M. Flahaut observes that "a solid insoluble pigment, the *xanthine* of Frémy and Cloëz, is in the first place to be distinguished from all the soluble colouring-matters, all of which are acted on very readily by reagents, and which are usually formed only in the epidermal cells." This xanthine Frémy states to occur always in the "form of clearly-defined grains, occasionally in the epidermal, much more often in the deeper-lying, cells, slowly soluble in alcohol and potassa. It is in all probability a modification of chlorophyll." The plants in which he found this substance are all early-flowering spring plants. The colours which pre-eminently distinguish our summer and autumn flora, the reds, pinks, blues, and some yellows (not due to xanthine, but to a soluble yellow pigment), are caused by the presence of substances which require both a strong light and a high temperature for their production; and Batalin has shown this to be especially the case with the red colouring substance. The difference between the prevailing colours of the spring flowers in England and in Switzerland is due to the same cause. Owing partly to the spring being a month later, partly to the more southern latitude and consequent greater elevation of the sun, partly to the clearer air of a high altitude, the light which opens the earliest spring flowers is much stronger in Switzerland than in England.

EXTRACTS FROM THE REPORT FOR 1880 *OF THE BOTANICAL EXCHANGE CLUB OF THE BRITISH ISLES.*

[Edited by Mr. James Groves].

Caltha palustris, L., var. *Guerangerii*.—Marshes near Bramber, W. Sussex, 18th May, 1880.—W. H. Beeby. I believe the true plant; it is one not familiar to me.—C. C. Babington.

Erodium cicutarium, L'Herit., var.—Flowers pale pink, 4½–5 lines diameter, petals without any spots, beak of fruit only ½–⅝ in. long when fully grown, leaflets more deeply cut, with smaller segments than usual (nearly pinnate, with simple linear-lanceolate divisions). Coast sand-hills, north of Deal, September, 1880.—J. G. Baker. I believe *E. pilosum*, Bor.—C. C. Babington.

Rubus Leesii, Bab.—Woodloes, Warwickshire.—R. L. Baker and H. Bromwich. This is the very curious and interesting form which Mr. Bromwich sent last year. It is the plant referred to in my last published notes. It must be joined to *Idæus*.—C. C. Babington.

R. fissus, Lindl. (Bab.!)—South Burn of Quoys, Hoy, Orkney, August, 1880.—J. T. Boswell.

R. imbricatus, Hort.—Great Doward, Herefordshire, October, 1878.—Augustin Ley. This is very near indeed to the original *imbricatus*, if not identical with it.—C. C. Babington.

R. imbricatus, Hort.—Trusham, S. Devon, September, 1880. Professor Babington writes:—"Your *imbricatus* is very near indeed to the original plant. I think that there can be no doubt of their specific identity." It is one of our commonest brambles at Trusham.—W. Moyle Rogers.

Rosa tomentosa, Sm., var. *Woodsiana*, H. and J. Groves.—Bush erect, compact. Prickles slender, uniform, decidedly curved, those of the main stem 4–4½ lines long, scar about 4 lines long. Leaves 2½–3 in. long and 2–2½ in. broad; petioles hairy and densely glandular; leaflets elliptic, the terminal 12–15 lines long and 6–9 broad, thinly hairy above and hairy and slightly glandular beneath, serrature copiously compound. Flowers 1–3. Peduncles and calyx-tube glandular. Sepals persistent, becoming erect. Corolla small, pale pink. Styles slightly hairy. Fruit ellipsoid. A form nearly allied to *R. scabriuscula*, from which, however, it differs by its smaller size, more compact habit, narrower leaflets with more compound serratures, more ellipsoid fruit, with decidedly erect persistent sepals. It differs from *R. fœtida* and *R. sylvestris* by its narrower and much less glandular leaves and hairy styles. Wimbledon Common, Surrey, 1876–8.—H. and J. Groves.

R. rubiginosa, L., var. *R. apricorum*, Rip.—Down, Box Hill, Surrey, 11th September, 1880.—H. Groves. This appears to be one of our commonest forms of *R. rubiginosa;* the principal characteristics appear to be the large roundish fruit, the deciduous sepals, and the hairy styles. M. Déséglise confirms the name.

R. dumalis, Bechst., tending towards *subcristata* (*fide* Baker).—Serquoy Burn, Orphir, Orkney, August, 1875.—J. T. Boswell.

R. Reuteri, Godet.—By the Oyce of Firth, Orkney, August, 1880.—J. T. Boswell.

R. subcristata, Baker, form. (*fide* Baker).—Oyce of Firth, Orkney, August, 1880.—J. T. Boswell.

R. corymbifera, Borkh., *fide* M. Déséglise.—West border of Bentley Wood, South Wilts, June and September, 1880. A handsome, strongly-arching, well-marked bush, plainly belonging to the aggregate *stylosa*, Desv. "Hairy variety, near *opaca*," is Mr. Baker's note on the label of the specimen I sent him before communicating with M. Déséglise; but it may be at once distinguished from *opaca* (as described in Mr. Baker's monograph) by the long bristly peduncles and the leaflets narrowed to the base, and hairy above as well as beneath. The hairiness of the plant is most remarkable, the leaves being whitish green beneath and tomentosa-like in tint and texture above; white petioles, stipules, bracts, and even the long leaf-pointed pinnate sepals are all densely clothed with silky hairs, long and short. The flowers are creamy white, and the calyx-tubes and fruits very slender elliptic. —W. Moyle Rogers. Mr. Baker considers that this belongs to the *Stylosæ*, and is near his *Desvauxii*. M. Déséglise, in his Catalogue Raisonné, places *R. corymbifera*, Borkh., among his *Caninæ Collinæ*, and in the clavis to that section gives the characters "folioles simplement dentées," "styles hérissés," "fleur rose," "pédoncules réunis en corymbe, folioles ovales, aiguës aux deux extrémités," with most of which Mr. Rogers's specimens do not agree.—J. G.

Sedum Forsterianum, Sm., vars. *glaucescens* and *virescens*.—These two (the former from dry exposed rocks at Stanner, the latter from shady damp rocks at the cascade of "Water-break-its neck,"

Radnorshire) were cultivated side by side in my garden, under similar conditions of light and temperature, *i. e.*, in a hot dry corner. This year the former threw up three times as many heads of bloom, the whole plant was more vigorous, and flowered nearly a fortnight earlier than the var. *virescens*.—Augustin Ley.

Galium ochroleucum, Koch.—Trusham, South Devon, 12th July, 1880. In some quantity, on a dry stony hedgebank, with *G. verum* and *G. Mollugo*.—W. Moyle Rogers. Box Hill, Surrey.—G. Nicholson.

G. Mollugo, L., var.—A dwarf form, with stems not more than half a foot long, forming dense masses on the dry coast sandhills north of Deal.—J. G. Baker. I think that I have never seen this curious small form; I presume that it is a form of *G. Mollugo*. —C. C. Babington.

Hieracium iricum, Fries.—Waas, Hoy, Orkney, August, 1880. J. B. T. Fortescue.

H. prenanthoides, Vill.—Paren'r Esgob, Brecon, 25th August, 1880.—Augustin Ley.

H. strictum, Fries.—Hobbister Rocks, Orphir, Orkney, August, 1880.—J. B. T. Fortescue.

H. strictum, Fries? Approaching *H. corymbosum*, Fr.—Shore, near Regal Burn, Waas, Hoy, Orkney, Aug., 1880.—J. B. T. Fortescue.

Myosotis palustris, With.—Bank of Bovey stream, by Jew's Bridge, Knighton Heath, S. Devon. Collected by Mr. T. R. Archer Briggs and me on August 28th, 1880, in this the first Devon station where it has certainly been observed by either of us. It seems as completely absent from the Teign Valley proper as from the whole Plymouth neighbourhood. Perhaps it may prove quite a local plant in the extreme S.W. of England.—W. Moyle Rogers.

Rumex crispus, L., b. *elongatus*.—Tidal mud of the Wye, Tintern, Monmouthshire, 26th July, 1880. Very abundant, and the earliest flowering dock; nuts well formed on July 26th, when *R. conglomeratus* was in flower, earlier than ordinary *crispus*, *trigranulatus* growing with it. Stature of this dock enormous, height often 6 ft. The root-leaves vary very much in breadth and crisping, and seem to be narrower and flatter the lower the plant grows on the level of the tide-way.—Augustin Ley. This is less perfectly trigranulate than the var. *trigranulatus*, and the granules are smaller in proportion to the size of the petal; but I have observed similar changes take place in a plant of ordinary *trigranulatus* from the Fife coast, which I have cultivated in the garden at Balmuto for some years.—J. T. Boswell.

Polygonum aviculare, L., e. *rurivagum*.—Roadside, Birstal Hill, Leicestershire, August, 1880. The five specimens marked * are all parts of one plant, too large to be preserved entire. It is much more diffuse and flaccid than typical *rurivagum* (which grew within a few feet of it), but has the long silvery ochreæ, the acute ascending leaves, and the green and crimson perianth of that form. The plant is almost entirely barren, having only two flowers, and this may account for its abnormal habit; but it is perhaps doubtful whether it should not be referred to *agrestinum* or

vulgatum.—F. T. Mott. I think this is *rurivagum*, but evidently growing under some unusual circumstances.—J. T. Boswell.

Euphorbia pseudo-cyparissias, Jord..—Dry bank, Henfield, West Sussex, June, 1880. Abundant and thoroughly naturalised, but evidently an escape from the garden of the late Mr. Borrer.—W. H. Beeby.

Potamogeton ——?—From the Tweed and Teviot. I sent a number of specimens in 1876, labelled *P. nitens* (see Report for 1876, p. 35), where it will be seen that Dr. Boswell considered them to be "very luxuriant specimens" of *P. nitens*. Dr. Trimen, in a footnote, 'Journal of Botany,' n. s. viii., p. 289, referring to the same specimens, writes: "It does not appear to me to be that species (*nitens*), but a large form of *P. decipiens* approaching *P. prælongus*, probably *P. salicifolius*, Wolfg." After seeing the above note, I wrote to Dr. Trimen, asking him to give it a name. His reply was: "It is not very easy to give a name to your Roxburgh larger plant further than that suggested in my footnote. Some of the foreign specimens of *P. decipiens* come very close. From *P. salicifolius*, Wolfg.! of which we have the type here [Herb. Brit. Mus.] it differs in the more rounded base and more obtuse apex of its leaves, but might pretty well go to it." Through the kindness of Dr. Boswell, I have examples of *P. nitens* from four different localities. The Tweed and Teviot plant differs from all these, and is also very different from Mr. Ley's Herefordshire *P. salicifolius*, distributed through the Club (see 'Report,' 1877, p. 10).—Andrew Brotherston. A dubious plant, and it is not easy to give a name without fruiting specimens. I cannot think it comes under *P. nitens*. It approaches specimens named *P. undulatus*, Wolfg., and in its peduncles and spikes it resembles *P. salicifolius*, Wolfg.—Arthur Bennett.

(To be continued).

Quelques mots sur l'étude des fruits. Par Paul Brousse. With Sixteen Plates. Montpellier, 1881.

The author of this interesting little study commences by pointing out the variability in value of fruits for classification. In the *Papilionaceæ*, *Cucurbitaceæ* and *Cruciferæ* the form of the fruit is a good distinguishing character, but it is not so with other orders, notably the *Papaveraceæ*, *Rosaceæ*, *Oleineæ* and *Solanaceæ*. These four orders are discussed in this work with a view to show that the differences are apparent rather than real. The work consists of three parts. The first treats of the definition of certain botanical terms: the author defines the receptacle as that part of the peduncle which bears all the floral whorls; the apex, which supports the carpels, he calls the gynophore; the part intermediate between this and the calyx whorl he terms the torus; the common receptacle of the *Synantheræ* he calls the clinanth; the involucre, the pericline; in placentation he substitutes the term *angular* for the axile placentation of Jussieu; *general* placentation for those cases where the ovules are scattered over the whole of the carpellary leaf, as in *Butomus*; he defines as fruit as the entirety

of the parts which develope after fertilisation, and when ripe fall off as a whorl. The second part of the book discusses the four methods of botanical investigation—analogical, organogenical, anatomical, and teratological: the author points out the absolute necessity of using all in pursuing researches on structure. The third part is occupied with the analogies in the dissimilar fruits of the four orders above mentioned. The fruit of *Glaucium* at first sight more resembles that of a crucifer than that of *Argemone*, but in the crucifer the ovary is from its earliest stages quadrilocular, and the ovules are arranged in regular rows, whereas in *Glaucium* it is originally bilocular, with the ovules irregularly scattered as in other *Papaveraceæ;* but as it grows a partition is formed cutting the two loculi into four, and causing all the ovules, except those in the secondary cavities, to abort. Another important distinction lies in the absence of albumen in the seeds of *Cruciferæ*, as opposed to the large albumen of *Glaucium*. It is true that while *Glaucium* has but two carpels, *Argemone* has four; but the number of carpels is not very constant even in *Papaveraceæ*, as it varies from four to twelve in *Papaver somniferum*. The structure and position of the stigmatic lobes, of the vessels supplying them, the position of the ovules, the large albumen, and the dehiscence, are the sam in both.

In the family of the *Rosaceæ* there appear even greater differences in the form of the fruits, but they all resemble each other in being formed of one or more free carpels, containing one or more seeds with large cotyledons, and no albumen. The chief differences between all the forms consist in variation in number of carpels, which is inconsistent even in the same species; the form of the receptacle, which varies from the cupule of the *Amygdaleæ* and *Roseæ* through the flattened disc of *Rubus strigosus* to the gynophore of *Fragaria;* the number of ovules, from the single one in the *Amygdaleæ*, the others having aborted, to the numerous ones of the *Spiræaceæ*. The *Pomaceæ*, though usually classed as syncarpous fruits, have the carpels quite free in the young state.

With respect to the *Oleineæ* the fruits appear very different; they take the form of a berry (*Ligustrum*), a drupe (*Olea*), a 2-carpelled capsule (*Syringa*), a monolocular samara (*Fraxinus*). All originally consist of two carpels, of which one aborts in the olive and ash; consequently these fruits cannot really be classed with apocarpous fruits, as is usually done. The remaining differences are due to increased development of the mesocarp.

In the *Solanaceæ*, *Solanum tuberosum* has a bare epicarp, the peduncle surrounded by the calyx; *Datura* has a spiny fruit, with only the disc of the calyx persistent; *Hyoscyamus* has a capsule quite concealed in the calyx; *Nicotiana* has a capsule of two separate carpels. The ovaries of all, however, except *Datura*, are identical in consisting of two cells, one to each carpel, which are separated by their joined edges, but in *Datura* there are four; this is due to a false partition which grows from the middle of each carpel, and divides each into two. This is quite secondary, and cannot be said to affect the form or structure of the fruit.

H. N. R.

Mr. William Robinson sends us a copy of his 'Wild Garden,' which, to quote the title-page, suggests "one way onwards from the Dark Ages of Flower Gardening, with suggestions for the regeneration of the bare borders of the London Parks." It is a very handsome book, the woodcuts—some of which are of remarkable beauty—being in the best style of art, as well as very faithful representations of the plants they are intended to depict. The letterpress is of course rather horticultural than strictly botanical, but it is very accurate, and shows a full acquaintance with the habits of our most important hardy herbaceous plants. Mr. Robinson has already done much to improve the taste of horticulturists, and his labours have borne abundant and satisfactory fruit; and the present volume cannot fail to add to his reputation, which is by no means inconsiderable.

Mr. F. G. Heath's somewhat similar work, with a similar title, 'My Garden Wild,' compares unfavourably with Mr. Robinson's book in appearance, inasmuch as it has no illustrations. The author is well known as an enthusiastic admirer of ferns, and as a somewhat diffusive writer upon them. In the present volume he has turned his attention to our common British plants, a large number of which he has cultivated in his garden at South Hackney. Mr. Heath's style is familiar to all who have read any of his other works, and the volume now before us will doubtless be welcomed by his admirers. His use of botanical terms is often rather lax; and his uniform practice of spelling specific names with small initial letters shows a want of acquaintance with scientific custom. Mr. Heath's enthusiasm is rather oddly distributed: he is rapturous about Chickweed, which he has always regarded "as an exceedingly beautiful object"; Dandelions "are welcome 'to him' in every possible position"; and Groundsel, from its early flowering, has "an especial claim on [his] regard." On the other hand, so really beautiful and artistic a plant as *Geum rivale* is dismissed with the remark that it "is somewhat like its congener, the Herb Bennet, except that the flowers are of a dull purplish brown hue, and droop instead of growing erect." Again, while *Alchemilla arvensis* is styled "a thing of beauty," and its "elegant foliage" is descanted upon, *A. vulgaris* elicits scarcely a word of approval. Mr. Heath occasionally indulges in bold metaphor—as when the spadix of *Arum* is spoken of as "wonderfully resembling a poker rising up like a spectre!"

Mr. Peter Henderson, of New York, has issued a 'Handbook of Plants,' arranged alphabetically after the manner of the 'Treasury of Botany,' but designed for the use of "florists, gardeners, and amateurs interested in horticulture," rather than for botanists. We are inclined to think, however, that the 'Treasury' would be a more useful volume even to those for whom this handbook is intended, although Mr. Henderson has brought together a good deal of information which is accurate in the main. It "has been written with a special view to the wants of the climate of the United States," and thus appeals mainly to our transatlantic brethren.

A SECOND volume of the 'Annales du Jardin Botanique de Buitenzorg' has been begun, under the editorship of Dr. Treub, the Director of the Gardens. The first part contains a paper by the late Dr. Scheffer on new or little-known plants of the Indian Archipelago; and two memoirs by Dr. Treub on the embryogeny of the *Cycadeæ* and *Loranthaceæ* respectively, each being carefully illustrated.

MESSRS. VEITCH and SONS, the well-known nurserymen, have issued a very useful 'Manual of the Coniferæ,' to which no author's name is attached. It is not professedly a scientific work, and a detailed notice of it would therefore be somewhat out of place in these pages; but it contains an extremely careful account of the hardy *Coniferæ* cultivated in Britain, rendered especially useful and attractive by numerous good illustrations, and fills for the order the position occupied hitherto by Loudon's 'Arboretum.' The principal drawback to the book is its very inadequate index.

NEW BOOKS.—G. C. W. BOHNENSIEG, 'Repertorium Annuum Literaturæ Botanicæ Periodicæ,' 1877 (Haarlem, Ex. Loosfes).—J. BRESADOLA, 'Fungi Tridentini,' fasc. i. (tt. xv.) (Trent, Monanni).—P. SACCARDO, 'Fungi Italici' (fasc. xvii–xxviii; tt. 641–1120).—'Flora Brasiliensis,' fasc. lxxxiv. (*Rubiaceæ*, pt. 1, by J. MUELLER, ARGOV; tt. 67).

ARTICLES IN JOURNALS.—AUGUST.

Botanical Gazette.—T. Meehan, '*Lilium Grayi*.'

Botanische Zeitung.—C. Gobi; 'Outlines of a Systematic Classification of the Glæophytes' (Thallophytes).—A. DeBary, 'Contributions to the knowledge of *Peronosporeæ*.'

Flora.—A. Geheeb and E. Hampe, 'Additamenta ad Enumerationum Muscorum in Rio de Janeiro et Sao Paulo detectorum.'—P. G. Strobl, 'Flora of Etna' (continued).—J. B. Jack, 'The European Species of *Radula*' (2 tt.).—H. Dingler, 'Two new Thracian *Astragali*' (*A. ictericus* and *A. maroniensis*).

Midland Naturalist.—J. E. Bagnall, 'Flora of Warwickshire' (continued).

Naturalist (Huddersfield).—W. West, 'Cryptogamic Report of Yorkshire Naturalists' Union for 1880' (continued).

Œsterreischische Bot. Zeitschrift.—A. Tomaschek, 'Hybernated Prothallia of *Equisetum*.'—S. Schulzer von Müggenburg, 'On *Reticularia Lycoperrdon*, Bull.'—D. Hirc, 'On *Salvia Bertolonii*.'—J. Kreuz, 'On Lenticels in *Ampelopsis hederacea*.'—P. Sintenis, 'On the Flora of Cyprus' (continued).—P. G. Strobl, 'Flora of Etna' (continued).

West Newman & Co. chr. lith

Ledgeriana. *Moens*

W. de Alwis del

Hanr. Newman & Co. chr. lith.

Cinchona Ledgeriana, *Moens*

Original Articles.

CINCHONA LEDGERIANA A DISTINCT SPECIES.

By Henry Trimen, M.B., F.L.S.

(Plates 222 & 223).

All who have followed the progress of the great and wonderfully successful experiment carried out in the East during the last twenty years, will be aware how prominent a part as a quinine-yielding tree is now filled by the plant known under the name of *Cinchona Ledgeriana*. The discovery of its value in 1872 gave new life to the flagging Cinchona enterprise in Java, which has since, under the able guidance of the present director, Mr. Moens, taken so leading a position; and the cultivation, propagation, and improvement of this species are now the principal objects of the plantations of the Dutch Government. In our own plantations in Sikkim, after years of neglect as one of the troublesome and hopelessly variable forms of *C. Calisaya*, the plant is now the object of careful cultivation; whilst in Southern India and Ceylon private planting enterprise especially has not been slow to turn to account the knowledge acquired, and the spread of *C. Ledgeriana*, in plantations in suitable localities, is merely a question of time.

There is no occasion to go into details as to the history of this species, but it is necessary to mention that the tree is only known to botanists in a cultivated state. All existing plants in the East are descendants of seed collected from about fifty trees growing on the almost inaccessible banks of the Rio Mamore in Bolivia, in June, 1865. It does not appear that any European has been within a hundred miles of this locality, or that the trees have been again seen. The actual collector was a half-caste, or native servant of Mr. C. Ledger, named Manuel Incra Mamani, who was afterwards murdered.* Mr. Ledger's seed was sent to London, and after being (unfortunately as it has turned out) declined by the India Office, was purchased by the Dutch Government in Dec., 1865, and sent to Java, where it was raised and the plants carefully attended to under the care of Van Gorkom, then director of the plantations. A portion, however, of the same seed was acquired by Mr. Money, a planter in the Nilgiris, whence some found its way to the Government plantations at Ootacamund, and a small quantity to those at Darjeeling. Hence it resulted that plants of this valuable kind were being grown both in India and

* J. E. Howard in Pharm. Journ., March 13th, 1880.

Java, but it was in the latter country that its superiority as a quinine-yielding variety was discovered.

In Java, too, it was soon observed that though showing a good deal of variation, the plants possessed some well-marked characters, and the name "*Ledgeriana*" became used (first in 1873 ?) in official reports and as a plantation name, to distinguish it from other varieties of *C. Calisaya*.* In India, however, it was not distinguished from other yellow bark trees, and it is only in the last few years that the trees have been picked out and identified by their botanical characteristics. Seed from Indian *Ledgeriana* also found its way to a few planters in Ceylon under the name of *C. Calisaya*; and trees five or six years old have been found on several estates mingled with other varieties, and generally unrecognized until the characters were pointed out by Mr. Moens during a visit to the island in Sept., 1880.

The name *Ledgeriana* received scientific sanction in 1876, being then published in Howard's magnificent work as *C. Calisaya*, var. *Ledgeriana*, How.† In this book, which I regret I have not at present at hand, much information will be found with reference to the plant and its allies. In now publishing it as a separate species, I almost feel to owe an apology for adding another to the already far too numerous specific names in the genus, and I should have abstained from doing so on my own judgment alone. But several supporting facts have been observed, especially by Mr. Moens in his long and intimate acquaintance with, and close study of, the plant and its allies. His opportunities for arriving at a correct conclusion are so much greater than those of any other person, that I feel there is little risk in adopting the view he holds (which will be more fully exhibited in his forthcoming book on the genus *Cinchona*), agreeing as it does with my own less well-grounded opinion.

A point which early struck me as noteworthy was, that among the amazing variety in the progeny of the ordinary *Calisaya*-forms nothing quite agreeing with *C. Ledgeriana* was ever observed. Desirous to know whether this was the case elsewhere, I made inquiries of Mr. Moens, who assured me that he never saw "anything like *Ledgeriana*, either botanically or chemically," to come from seed of a *Calisaya*. I understand that Mr. Gammie has the same experience. This is very remarkable, for the progeny that come from any sowing of *C. Calisaya* seed are certainly less like one another than some are like *C. Ledgeriana*; moreover, seed from the latter has not hitherto been found to come very true, even the progeny of the original seed from Bolivia showing a good deal of variation. But as seen under cultivation this has as yet been always the case with Cinchonas. How far it results from a strong natural tendency to variation, and how much is due to cross-fertilization, we have at present little direct evidence to show. The latter must, however, be a cause, and alone explains

---

* Howard, Quinol. Ind. Plant. p. 84.

† It is used in Howard's Notes on *Cinchona* in Jonrn. Linn. Soc. xiv. p. 174 (1874).

the undoubted improvement in the true-ness of seed from a tree hitherto grown in proximity to other species after isolation by their destruction. This has been conspicuously shown in the case of *C. Ledgeriana* itself in Sikkim, the seedlings from which, since Mr. Gammie uprooted nearly all the neighbouring trees, now come remarkably true, whereas before that was done the sporting was so great that Dr. King would not propagate by seed at all. The same results have been even more marked in Java. We may hope for some direct evidence on the subject, however, in time, as Mr. Moens is now conducting experiments in artificial hybridization with a view to comparison of the results with the naturally-produced sports.

So much interest attaches to this *Cinchona* that, though it has been comparatively recently the subject of three fine plates in Howard's sumptuous volume,* I have thought that a less ambitious figure, carefully drawn from living specimens of the plant cultivated in Ceylon, might fitly accompany this notice. The artist has not been very fortunate in the specimen he had for delineation, which was from a tree grown in poor soil and an unsuitable situation, and flowering at an earlier age than would be the case with a more healthy subject. But there was then little choice as to specimens in Ceylon, where we have but few adult trees of the kind.

The following description gives those characters only which are helpful to distinguish *C. Ledgeriana* from its allies. They are chiefly taken from fresh Ceylon examples, but I have been assisted by dried specimens of some of the original trees from Java, for which I am indebted to Mr. Moens:—

CINCHONA LEDGERIANA, Moens, MSS.
C. Calisaya, Wedd., var. *Ledgeriana*, Howard, Quinol. Ind. Plant., p. 84, tt. 4—6 (1876).

LEAVES when adult varying from pure lanceolate† to oval or to linear-lanceolate, or to oblong-oval, *but always having the broadest part at or about the middle* and especially narrowing towards either end, apex sub-acute (rarely acute) or sub-obtuse, base much attenuate into the short petiole, always perfectly glabrous on both surfaces, subcoriaceous, often wavy, full deep green, paler beneath, shining but not polished above, the base of the midrib and petiole more or less stained with orange-pink, the veins prominent beneath, scrobicules not conspicuous mostly confined to the upper vein-angles, stipules enclosing the terminal bud, quickly caducous, lanceolate-oblong, subacute, glabrous, keeled, and with numerous parallel veinlets.

---

* Quinol. Ind. Plant., tt, 4. 5, 6.

† The sense in which I have always used the terms "lanceolate" and "oval is that given in English text-books, and more precisely defined in this Journal, 1871, p. 370. But several descriptive botanists use the term "lanceolate" to express a form which I am accustomed to call ovate-lanceolate or narrowly ovate, *i. e.*, with the broadest diameter below the middle; whilst "oval" is employed with extreme laxity for several very different outlines.

Flowers *small*, on short curved pedicels and thus *drooping or divaricate*, tufted or crowded at the ends of the branches of the usually small rather dense pyramidal panicle; *buds* oblong-ovoid, blunt, when mature *not at all or very slightly widened at the end and never abruptly enlarged there.*

Corolla with a short wide *tube* about $\frac{1}{6}$ inch long, *somewhat inflated in the middle*, pale green, *lobes pure white* or somewhat cream-coloured (very rarely pinkish), the marginal hairs copious and long.

Capsule short, ovoid-oblong, rarely more than $\frac{3}{8}$ inch and never more than $\frac{1}{2}$ inch in length, capped by the persistent cup-shaped calyx-limb with erect teeth.

As with other species of *Cinchona* in cultivation there is in this a great deal of variability in the form of the leaf, even in adult trees. On the flowering branches they are often narrow and almost strap-shaped, whilst in some plants they are as broad as *C. officinalis*, var. *Condaminea*, from which it is indeed not always easy to distinguish them. The amount of red coloration in the veins is variable, and rarely quite absent. Though always absolutely glabrous when mature, this is by no means the case with young plants; seedlings up to a year or two old are frequently more or less hairy beneath, but as the trees get older this disappears. These young leaves are also often of very large size, and the upper surface usually has a velvety sheen or *reflet;* not unfrequently the under side is of a fine purplish tint; but none of these points are, I think, of much importance. The unexpanded leaves and the buds and young soft shoots have, however, a bronzed or olive-orange tint by which in a field of *C. Calisaya* the plants of *C. Ledgeriana* may often be picked out at first sight. When withering the leaves turn orange-lake to brown.

The tree does not apparently attain any great height; it is distinctly pyramidal in shape, and less handsome in appearance than some other species. The bark is usually rather clean and smooth; but there seems to be considerable variability in appearance, and I cannot learn that any guide as to quality is afforded by it.

The long-styled and short-styled forms seem to be pretty equally distributed in Ceylon specimens, perhaps the short-styled (with exserted stamens) being rather more frequent. I do not observe any correlated differences in foliage or inflorescence. The trees flower here during the months from May to September.

The capsules are described by Dr. King as "nearly globular," but I have seen none of that form, all being as above described. Those originally collected were considered by Mr. Howard to be similar to *C. Calisaya*, var. *microcarpa*, Wedd. (figured in the Quinology, t. 15).

The best marks distinguishing *C. Ledgeriana* from all forms of *C. Calisaya* are found in the flowers. Their drooping habit, and more especially the small size, short inflated tube, and white colour of their corolla, are quite characteristic; the difference is well seen just before expansion, when in *C. Calisaya* the tube is topped by a

suddenly-inflated knob quite absent in the present species. The flowers certainly thus make an approach to *C. micrantha*, R. & P., but the very different foliage and capsules widely separate the two species. The plant alluded to by Mr. Howard in this Journal† under the name of the "Morada," and collected by Pedro Rada on the rivers Bossi and Beni in Eastern Bolivia, is, to judge from the coloured figure given of the young leaves, extremely like *C. Ledgeriana*. The bark, too, is known to be a good sort of *Calisaya*-bark. The trees, however, are said to reach a height of 120–150 feet, and the flowers of this "morada" to be "purple"; but a closely-allied form, "la verde," has them "white."

For the specimens figured I am indebted to Mr. Walter Agar. They are from Mahanilla Estate, in the Maskeliya district of Ceylon, about $5\frac{1}{2}$ years old from seed, and about $9\frac{1}{2}$ feet high (being, as above mentioned, grown in unfavourable circumstances). The seed came from the late Mr. MacIvor, Superintendent of the Cinchona plantation in the Nilgiris, obtained, there can be no doubt, from trees which originated from Mr. Ledger's seed.

Peradeniya, Ceylon, September 1st, 1881,

Explanation of Plates 221 and 222.—Fig. 1. A flowering twig. Fig. 1.* A panicle-branch showing the dimorphic habit of the flower. Fig. 2. Buds (enlarged). Fig. 3. Calyx, with short style (enlarged). Figs. 4, 5. Corolla opened (enlarged). Fig. 6. Fruit. Fig. 6.* Id. (from Java). Fig. 7. Tree from which specimen was taken ($\frac{1}{3}\frac{1}{2}$). Fig. 8. Top of a seedling plant.

A CHINESE PUZZLE BY LINNÆUS.

By Prof. Asa Gray.

In the 'Species Plantarum' Linnæus characterized and named an *Athamantha chinensis*, and gives the following indication of its source:—"Habitat—Chinensem dixit Barthram qui semina misit ex Virginia." Loureiro, taking his cue from the specific name, applies it to some Chinese Umbellifer. DeCandolle, in the 'Prodromus,' seizing upon the phrase "Statura *Selini Monnieri*," adds the name (with references both to Loureiro and to Linnæus) as a synonym to *Cnidium Monnieri*, giving the habitat only of "Gallia Austr.," and that with a mark of doubt. American botanists have generally passed it by, notwithstanding the statement that Linnæus raised the plant from seed sent by Bartram from Virginia. Some one—I cannot now say who—suggested to me the solution of this riddle, namely, that the seeds sent by Bartram belonged to *Selinum canadense*, and came from *Genesee*, which name Linnæus had inadvertently changed to *Chinense*. The Linnean herbarium confirms this suggestion as to the plant, which although only in the flowering state, well accords with *Selinum canadense*; and so does the description of the

† 'Journ. Bot.,' 1869, p. 1, t. 87.

fruit in the 'Species Plantarum,' which Linnæus must have drawn up from the plant in the Upsal garden at a later period, without preserving a specimen. Now this plant inhabits the "Genesee country," namely, the western portion of the State of New York, which is traversed by the Genesee River, and which had been visited by Bartram; and so it is almost certain that the *Chinense* or *Chinesee* written upon the herbarium-sheet answers to *Genesee*.

There are several other Linnæan puzzles relating to North American plants which have from time to time been found out. *Rubus Canadensis*, L., for instance, was described as having 10, 5 or 3 leaflets; and it remained an enigma until, upon my first visit to the Linnæan Herbarium, I found that the ten leaflets belonged to two superimposed leaves which had been mistaken for one. A not uncommon state of *Lysimachia stricta*, without flowers, and bearing concatenate or torose bulblets in the axils, is the original of the *Viscum terrestre* of Linnæus. An abnormal and undeveloped specimen of *Rhus typhina* is the original of the *Datisca hirta* of Linnæus.

Then there are specimens in the Herbarium mistakenly attributed to North America, such as two South European species of *Senecio*, upon one of which *Senecio canadensis*, upon the other *Cineraria canadensis*, were founded, According to Schultz Bip., the first proves to be *S. artemisiæfolius*, Pers.; the second, a form of *S. Cineraria*. As it is most unlikely that the former was ever cultivated in Canada, a total mistake respecting the source of the specimens may be presumed. The same must be said of *Solidago Noveboracensis*, L., which is founded on a specimen of *Aster tataricus!* The specimen on which Linnæus founded his *Hieracium Kalmii* still remains a puzzle. We can only say that it is not a *Hieracium*, and not a North American plant.

A NEW *DRACÆNA* FROM SINGAPORE.

By J. G. Baker, F.R.S.

Amongst a number of plants brought home by Mr. Cantley—who was appointed a few months ago superintendent to the botanic garden at Singapore, and who is now in England—are specimens of a fine new species of *Dracæna*, which it is to be hoped he will be able to procure again and introduce into cultivation. To compare it with familiar types it may be said to come in about half-way between *D. angustifolia* and *D. fragrans*. According to the sequence adopted in my monograph, in vol. xiv. of the 'Journal of the Linnean Society,' it should follow No. 14, *D. timorensis*, Kunth.

D. Cantleyi, *Baker*, *n. sp.* Leaves sessile, oblanceolate, 16–18 in. long, 3–3½ in. broad above the middle, narrowed gradually from the middle to a base about ½ in. broad, moderately firm in texture, brown-tinted, with an indistinct midrib visible from base to tip. Racemes copiously panicled, the lower branches a foot long, dense; branch-bracts small, lanceolate; pedicels 6–8-nate, ¼–⅓ in. long,

articulated at the tip, much longer than the small deltoid membranous flower-bracts. Perianth whitish, clavate, $1\frac{1}{8}$–$1\frac{1}{4}$ in. long, cut down to a small campanulate basal cup. Stamens distinctly shorter than the perianth-segments; anthers whitish, linear, $\frac{1}{12}$ in. long. Style finally exserted; stigma capitate.

ON THE NATURAL HISTORY OF MADAGASCAR.

By J. G. Baker, F.R.S.*

Area and Physical Geography.—Madagascar is the third largest island in the world, Australia and Borneo being the only two that surpass it in size, the latter but slightly. It extends over about 15° of latitude, its southern extremity being a little outside the tropic of Capricorn, and the remainder all included in the south tropical zone. It is nearly a thousand miles long, with an average width of 250, and an extreme width of 360, miles. Its area is nearly a quarter of a million square miles, about equal to that of France, and about four times that of England and Wales; and there is at the present day a channel 240 miles broad between it and the African continent. It is divided into two well-marked physical regions. About a third of its area is occupied by a mass of high land, the greater part of which is at an elevation of between 3000 and 5000 feet above sea-level. This mass runs from the extreme north of the island down south as far as the tropic of Capricorn, and forms the water-shed between the principal rivers, which run east and west. It forms a ridge of which the long diameter is north and south, and of which the width from east to west varies from 80 to 160 miles. It slopes steeply towards the east, and on this side are many of the umerous rivers, all of which are short, deep-cut gorges through this eastern escarpment, and make their way to the plain in a succession of wooded cataracts. The falls of the Matinana, for instance, leap at a single plunge a depth of 500 or 600 feet. A good deal of this central elevated portion of Madagascar is bare and somewhat dreary-looking country, consisting of rolling moor-like hills, covered principally with long grass, which gets very brown and dry by the end of the summer. The soil is generally a red clay, and granite, gneiss and basalt are present throughout the whole of this region, which has evidently been raised above the sea-level from a very early geological epoch. The highest level anywhere reached by the forest is 6000 feet. There are abundant marks of recent volcanic action, but there are now no active volcanoes left in Madagascar, though they occur to the west of it in the Compro group, and to the east of it in Bourbon. In the southern portion of the island there is some fine mountain scenery in the Betsileo country, and in the centre the Ankaratra mountains rise to a height of 9000 feet within a short distance of the capital, which itself stands at a height of 4000 feet

---

* Read at the meeting of the British Association at York, September, 1881.

above sea-level. This range consists of five or six principal peaks, arranged like a cross, and in the clear atmosphere which prevails in that part of the world it forms a conspicuous object from a great distance. The valleys, interspersed between these red-clay moorlands, are often wooded, and in some places there are tracts of rich black alluvial soil, two of the principal of which occur in the neighbourhood of the two chief cities of the interior, and are used for the cultivation of rice, which in Madagascar is the "staff of life," like bread with us in Europe. The remaining two-thirds of the island is occupied by a country of typically tropical climate, consisting mainly of extensive plains elevated not more than a few hundred feet above sea-level. Of its geology very little is known, but it is probably underlaid by sedimentary rocks of a much later date than those of the interior. The fossils which have been found are Neocomian, Jurassic, and Tertiary. This belt of low country is narrow on the east side of the island, but much broader on the west, and on the south it occupies a wide continuous area. The river that runs down from the capital in a north-western direction, the Betsiboka, is 300 miles long. It can be ascended by steamers of light draught for nearly 100 miles; boats can sail up for 60 miles more; and from the point where navigation terminates the merchandise has to be carried 85 miles by road up a steep slope to Antananarivo. In some places ranges of hill, which run north and south, diversify the surface of this low country. A belt of primæval forest runs all round the island: it comes down to the shore at the north-west, opposite the French island of St. Marie and northward, and here it fills up the whole space between the coast and the mountain region, but generally it forms a belt with an average breadth of 15 or 20 miles, which does not come down to the shore. On the east side of the island this belt splits into two, and its upper half runs along the edge of the mountains; on the west side of the island the belt of forest runs through a level country. This belt of primæval forest is substantially continuous for a length of upwards of 2000 miles, and the trees which compose it have as yet been only explored botanically very imperfectly. These, then, are the main physical features of the island: the great central ridge of elevated ground; the encircling tropical plains, broad on the west side of the ridge, narrow on the east; and this long girdle of untouched primæval forest.

The population of the island is vaguely estimated at five millions. There is a vast extent of country in the plains where the soil is fertile, which is without inhabitants, and there are wide tracts of land between the territory occupied by the different tribes in the hill country, as, for instance, what is called "No-man's Land," between Imerina and Betsileo, which are only peopled very thinly, or not at all. As scarcely any of it is desert or rainless, it could doubtless support ten or twenty times its present population; and there is probably nowhere else in the tropical zone such a wide extent of country so little interfered with, or where man has done less to modify the natural distribution of the animals and plants.

Climate.—In Madagascar we possess very few precise dates bearing on the subject of climate, but what we know about Mauritius will indicate all that is necessary for our present purpose. At Port Louis the average annual mean is 78° Fahrenheit in the shade, and the average daily range is from 70° at sunrise to 86° in the middle of the afternoon. In Bourbon the mean temperature throughout the year is stated to be 77° in the shade, that in exposed places often rising to 50° more; the average minimum of the day throughout the year being 72°, and the average maximum 82°. No doubt this may be taken as a fair representation of the state of things that holds good for the sea-level in Madagascar. If we follow the accepted rule of deducting 10° Fahr. for every hundred yards in elevation, this will give us an average of 65° for the temperature of the capital, which is about that of Naples or Palermo; and an average of 48° Fahr., which is that of London, for the summits of the highest mountains of the island. But in making this comparison we must remember to take into account how little within the tropics the months vary in temperature and the days in length between one season of the year and another, so that *Aspidium aculeatum* or *Lycopodium clavatum* on a Madagascar mountain would pass through a very much smaller range of temperature throughout the year than they would on a Surrey heath. In a trip which Dr. Meller made in 1862, in July and August, from Tamatave to Antananarivo, the maximum temperature here noted in the shade was 88°, and the minimum 49°. Madagascar falls within the zone of regular periodical rains and winds. The wet season lasts for about our winter half of the year, from November to April, when the monsoon wind blows from the north-west. At this time there is a heavy fall of rain, which sometimes continues incessantly for several days. In Mauritius the annual rainfall varies from 146 inches on the east coast to 38 inches at Port Louis. The vegetation of the forests, the abundant epiphytes, the tree-mosses, the filmy-ferns, and the viviparous character which so many of the ferns put on, show clearly that they get an abundant supply of moisture. The dry season, which is rather colder, lasts from May to October, when the wind blows from the south-west; and as the summer advances the vegetation of all the exposed places turns very dry and brown, and burns readily if set on fire. Dr. Parker writes:—"The flowering season of most plants in Madagascar, whether in the forest or out of it, is from October to May, *i.e.* during the rainy season; but by far the great majority of them wait until December is nearly or quite over until they flower; whilst the majority of grasses and *Cyperaceæ* wait for the approach of the colder dry season, flowering best between March and May."

Zoology.—The fauna of Madagascar is a very remarkable one, and exhibits an extraordinary amount of peculiarity, both in its positive and negative characteristics. Of the mammals there are sixty-six species known in the island, and they are harmless, timid animals, often of small size and nocturnal habits, of a kind that could only maintain their existence in the struggle for life either

by being protected by isolation or their facility for hiding themselves from the notice of their predatory brethren. Although monkeys, apes and baboons are numerous and widely-spread in the tropical and subtropical regions of the adjacent continent, there are none of them in Madagascar, and the Quadrumana are only represented by the lemurs, of which there are six genera and thirty-three species, just half the whole number of the mammals of the island. The lemurs are spread from Angola and Guinea to the Malay archipelago, but Madagascar is the great head-quarters of the family, aud of the four subfamilies two are exclusively confined to the island. The Cheiromys, or aye-aye, is a very peculiar type, intermediate in habit between a monkey and a squirrel, with very large ears, large eyes, long claws, and a long bushy tail. It is now classed at the end of the Quadrumana, and is quite confined to Madagascar. There are six bats, but they all belong to widely-spread families. Of the Insectivorous Feræ there are about a dozen, consisting of one shrew, a large cosmopolitan group; and all the rest Centelidæ, a group allied to the hedgehogs and moles, only known elsewhere at the present day in two or three of the larger West Indian Islands. In Carnivora the lions, bears, tigers, leopards and hyenas of the adjacent continents, are totally absent, and the family is represented only by *Cryptoprocta ferox*, a cat-like plantigrade animal of savage disposition, like a small leopard in shape and size, which is confined to the island, and has no near affinity; several civets, and an ichneumon. The Rodentia consist of four species of rats and mice of peculiar genera, which, as individuals, are numerous and troublesome. In the Ungulata the antelopes, so plentiful both in Asia and Africa, the buffalo, horse, zebra, elephant, hippopotamus, and rhinoceros, are entirely absent, and the order is only represented by a single river-hog of the African genus *Potamochœrus*, which is very rare. The bones of a small hippopotamus have been found in the south-west in a half-fossil state. Mr. Wallace has treated the question of the Madagascar Mammalia in full detail in his 'Island Life' and former work on the 'Distribution of Animals,' and draws the conclusion that it is likely that the absent types have originated in the Palæarctic region, where most of the genera are found in a fossil state in the rich Miocene deposits of France, Germany, Greece, and the north-west of India; that they have been stopped from spreading southward by the sea that extended in early tertiary times from the Atlantic to the Bay of Bengal; and that Madagascar must have been isolated before they extended themselves so far in a southern direction.

Birds.—The birds of the island show the same strongly-marked peculiarity of character as the Mammalia. Upwards of one hundred species of land-birds have been determined scientifically, and of these not more than half a dozen are known elsewhere, whilst about fifty belong to thirty-three genera which are peculiar to the island, and the remainder are endemic species of African and Asiatic genera. The Raptores are represented by one eagle, and several hawks and owls. One of the hawks has been adopted as

the crest of the Hova government, and an immense figure of the bird crowns the roof of the two chief royal palaces at Antananarivo. There are numerous *Picæ* and *Passeres* in the woods, none of which are remarkable for their large size or musical capacity, but some of them are striking in appearance from their brilliant colours. There is a kingfisher with a lovely purplish blue body, a yellow breast, and a scarlet throat; a weaver-finch about the size of a lark, which flies in flocks of thirty or forty in the rice-fields, of which the male is a brilliant scarlet, whilst the female is sober brown; and several Nectarinidæ, or sun-birds, of beautiful brilliant metallic hues. There is a large dark blue cuckoo, and another which is a blackish glossy green, with a very long tail, which is forked at the extremity; a very intelligent slaty black parrot, and another dark green one; some bright green parroquets, about the size of love-birds, that fly in flocks; and a large crow, with a white collar and a white breast. Of plainer coloured perching types, thrushes, pigeons, goat-suckers, wagtails, swallows and swifts are represented. About the lakes and in the marshes there are numerous Grallæ and Gallinæ, such as ducks, waterhens, sandpipers, quails, guinea-fowls, herons, storks and ibises; so that Madagascar is a country where a sportsman can find plenty of occupation. Of characteristic African types Mr. Wallace enumerates the plantain-eaters, glossy starlings, ox-peckers, barbets, honey-guides, hornbills and bustards as being entirely absent; as is the case also with several of the striking Asiatic and Polynesian types, such as the trogons, golden-pheasants and birds of paradise. At the present day there is no ostrich, emu, or cassowary known in the island; but the bones have been found of at least three Struthionidæ, one of which, the Æpyornis, had an egg a foot long and nine inches the shorter diameter, with a capacity six or seven times that of the ostrich, and 140 times that of an ordinary barn-door fowl.

Reptiles.—The lower groups of animals have been less fully studied than the Mammalia and birds. In Reptilia there are several snakes, but no venomous ones are known in the central hill-region. The cosmopolitan family of the Colubrinæ is represented by two American genera, *Phylodryas* and *Heterodon;* and by a third genus (*Herpetodryas*) common to China and America. The other genera are all endemic, but belong to widely-spread tropical families. Two families, Lycodontidæ and Viperidæ, both abundant in Tropical Africa and Tropical Asia, are absent. Lizards are numerous, belonging mostly to specially African or widely-spread tropical families. There are some species of two American genera of Iguanidæ, and that family, except for these, is entirely restricted to America; and a genus of Geckoes, which also inhabits America and Australia, occurs also in Madagascar. Crocodiles are plentiful and troublesome; and there are several tortoises of African affinity, including a gigantic species, which is probably now extinct in Madagascar, but which still survives in the small uninhabited islets of the Aldabra group, 4° further north. There are two living specimens of this huge creature at the zoological gardens, of which the male is between five and six feet long, rather broader than long,

weighs 800 pounds, and is said to be able to carry a weight of two tons on its back.

As regards the general bearing of the character of the fauna of the island on its previous physical history, we may regard it, without proceeding further through the lower groups of animals, as a proposition fully established by the facts that have been already brought forward that Madagascar produces many striking types that are peculiar to it, and that many striking and widely-spread and copiously-represented types which inhabit the neighbouring continent are absent; and that as a whole the fauna possesses the stamp of a remarkable individuality of character, such as can only be explained by supposing it to be the result of long insulation.

General Character of the Flora.—But when we come to deal with the botany of the island a great many of the facts point in an entirely different direction. No special work on the flora of Madagascar has yet been written, but taking the species that have been described in general monographs and scattered papers in the various periodicals and transactions of learned societies, and adding to these the species contained in the Kew Herbarium, including five or six parcels that have been received from different sources during the last two years, I estimate that we have now definite knowledge of at least 2000 flowering plants that grow wild in Madagascar; and considering how many novelties each new parcel from an unexplored district contains, and what a large proportion of the named and described species gathered by the French collectors we do not possess in England, and how rich the fern-flora of the island, which has been much better explored than the flowering plants, has proved, I should not be at all surprised if the number of flowering plants inhabiting the island should ultimately be raised to 4000 or 5000; so that of course all the remarks that follow must be considered as founded on a botany that is perhaps not more than half-known. But looking at the catalogue of Madagascar plants, as it stands according to present knowledge, as a whole, the first point that strikes the mind is how thoroughly the general plan of the flora follows the same lines as that of other tropical regions of the Old World. This may be illustrated in various ways, as follows:—In the first place by taking the natural orders one by one, and noting how nearly they run parallel in Madagascar and the adjacent tropical areas.

The following Table shows the number of the genera and species of each natural order of *Thalamifloræ* known in Mauritius, Madagascar, Continental Tropical Africa, and India apart from the Himalayas. Out of fifty-five known orders of *Thalamifloræ* only eight are not here represented; out of these forty-seven, thirty-seven are already discovered in Madagascar. Of the ten orders not yet known in Madagascar none are known in Mauritius proper, but two are represented by single species in the Seychelles. Two of them are confined to Tropical Asia, and one to Tropical Africa; but the other seven are common to both continents.

	MAURITIUS.		MADAGASCAR.		TROPICAL AFRICA.		TROPICAL INDIA.	
1. Ranunculaceæ . .	1	1	2	15	4	18	5	17
2. Dilleniaceæ . . .	1	1	1	3	1	3	6	34
4. Magnoliaceæ . .	...	...	...	...	...	...	5	7
5. Anonaceæ . . .	2	4	5	10	12	59	25	190
6. Menispermaceæ .	1	4	7	10	11	22	19	34
7. Berberideæ . . .	...	...	...	...	1	1	1	3
8. Nymphæaceæ . .	1	1	1	5	2	3	5	8
11. Cruciferæ . . .	3	3	3	6	21	45	2	6
12. Capparidaceæ . .	2	2	7	20	11	61	8	49
13. Resedaceæ . . .	...	...	...	...	4	5	1	1
15. Violaceæ	...	...	4	20	4	16	3	16
17. Bixineæ	3	3	5	8	6	27	9	26
18. Pittosporeæ . . .	1	1	1	8	1	2	1	5
20. Polygaleæ . . .	...	...	1	5	3	24	5	30
21. Frankeniaceæ . .	...	...	...	...	1	2	1	1
22. Caryophyllaceæ .	2	2	2	2	12	25	7	11
23. Portulaceæ . . .	...	...	1	1	2	8	2	6
24. Tamariscineæ . .	...	...	..	...	1	2	1	3
25. Elatineæ	...	...	...	...	1	5	2	6
26. Hypericineæ . .	1	1	3	11	5	18	2	12
27. Guttiferæ . . .	1	2	5	19	6	12	6	61
28. Ternstromiaceæ .	1	1	...	...	3	3	11	37
29. Dipterocarpeæ . .	1	1	...	...	3	3	9	92
30. Chlænaceæ . . .	...	...	5	9	2	2	...	...
31. Malvaceæ . . .	7	7	10	28	17	88	20	85
32. Sterculiaceæ . .	6	13	6	22	14	51	16	79
33. Tiliaceæ	2	3	4	15	10	70	13	109
34. Linaceæ	2	4	2	6	6	14	6	18
35. Humiriaceæ . . .	...	...	...	...	1	1	...	...
36. Malpighiaceæ . .	...	...	2	4	5	14	3	10
37. Zygophylleæ . .	1	1	1	1	5	14	4	8
38. Geraniaceæ . . .	2	3	4	15	6	39	7	101
39. Rutaceæ	3	7	2	2	4	12	19	70
40. Simarubeæ . . .	2	2	1	1	9	11	9	16
41. Ochnaceæ . . .	1	1	2	9	2	19	4	11
42. Burseraceæ . . .	2	2	1	1	4	9	10	39
43. Meliaceæ	2	4	1	5	5	15	19	83
44. Chailletiaceæ . .	...	...	1	8	1	15	1	6
45. Olacineæ	3	3	3	3	15	26	23	65
46. Ilicineæ	...	...	1	2	1	1	1	14
47. Celastrineæ . . .	3	3	7	22	6	44	13	85
49. Rhamneæ . . .	4	5	6	15	8	12	11	40
50. Ampelideæ . . .	2	3	2	12	2	78	3	75
51. Sapindaceæ . . .	8	11	9	11	13	37	20	55
52. Sabiaceæ	...	...	...	...	...	...	2	9
53. Anacardiaceæ . .	3	5	7	14	11	31	18	93
55. Moringeæ . . .	...	...	1	1	1	1	2	1
			126	350				

Large cosmopolitan Genera in Madagascar.—One of the most striking and suggestive characters of the flora of the intertropical zone of the world, taken as a whole, is the large extent to which it is everywhere made up of species representing large genera which do not show any special preference for one of the three great continents, or to the Old or New World, as compared with each other. The area embraced by the intertropical zone is about twenty millions of square miles out of fifty millions for the whole world, and there are many genera that contain 300, 400, or 500 species that are largely represented both in America, Asia, and Africa. Some of these are herbaceous glumiferous Monocotyledons, as, for instance, *Cyperus* with 400 species, and *Panicum* with 500. The large genera of ferns all fall into this category, *Polypodium*, *Acrostichum*, *Asplenium*, and *Pteris*. Some of them are Dicotyledons, with separated sexes and small inconspicuous flower-wrappers, such as *Ficus* with 400 species, *Piper* with 600, *Phyllanthus* with 400–500, *Croton* 450. But many of these large cosmopolitan genera are Dicotyledons of shrubby or arborescent habit, with insect-fertilised hermaphrodite flowers, a distinct calyx and corolla, and showy scented petals. *Loranthus*, with 300 species, although exclusively parasitic, falls into this geographical category; so do *Psychotria* with 500 species, *Indigofera* with 300–400, *Vernonia* with 400, *Solanum* with 500, *Eugenia* with 500. And a point that must be prominently taken into account in estimating the general relations of the flora of Madagascar is that these large cosmopolitan genera are nearly all represented in the island. This holds good of all those that have been already mentioned; and others of the same class that may be named in addition, of which two species or more are already detected in the island, are *Ipomæa*, *Vitis*, *Gouania*, *Hibiscus*, *Gomphia*, *Ochna*, *Desmodium*, *Crotalaria*, *Acalypha*, *Cleome*, *Capparis*, *Cassia*, *Dalbergia*, *Eragrostis*, *Commelina*, *Dioscorea*, *Dalechampia*, *Andropogon*, *Scleria*, *Kyllingia*, *Mimosa*, *Jussiæa*, *Homalium*, and many others.

Widely-spread Species.—The marked tendency to uniformity in general character which is shown by the flora of the whole tropical zone is further illustrated by the fact that a considerable number of species are spread universally through the Old World, and that a considerable number extend their range in addition to Tropical America. Out of 1058 flowering plants and vascular Cryptogamia which are indigenous in Mauritius and the Seychelles, 370, or about one-third of the whole, occur also both in Tropical Asia and Continental Africa; and of these 225 species, or about one in five of the whole flora, extend their range to Tropical America. Of the 225 cosmopolitan Mauritian species, 159 are flowering plants and 66 are ferns and fern-allies. For Madagascar I have been able already to make out a list of 100 cosmopolitan flowering plants, and I have no doubt a closer search through the London herbaria would raise the number to 150. The orders which are most largely represented are *Graminea* and *Cyperaceæ* in Monocotyledons, and, in Dicotyledons, *Compositæ*, *Leguminosæ*, and *Malvaceæ*.

Gramineæ.—*Coix Lacryma*, *Dactyloctenium ægyptiacum*, *Eleusine indica*, *Cynodon Dactylon*, *Panicum Crus-galli*, *fluitans*, *prostratum*, *sanguinale*, and *Colonum*, *Chloris barbata*, *Oplismenus Burmanni*, *Stenotaphrum complanatum*, *Andropogon contortus*.

Cyperaceæ.—*Cyperus compressus*, *rotundus*, *difformis*, *articulatus*, *Mariscus umbellatus*, *Abilgaardia monostachya*, *Fimbristylis diphylla*, *Scirpus mucronatus*, *Fuirena umbellata*, *Lipocarpha argentea*, *Cladium Mariscus*.

Compositæ.—*Elephantopus scaber*, *Ageratum conyzoides*, *Adenostemma viscosum*, *Mikania scandens*, *Gnaphalium luteo-album*, *Eclipta erecta*, *Bidens pilosa* and *bipinnata*, *Chrysanthellum procumbens*, *Sonchus asper* and *oleraceus*.

Leguminosæ.—*Crotalaria verrucosa* and *striata*, *Tephrosia purpurea*, *Zornia diphylla*, *Desmodium triflorum*, *Abrus precatorius*, *Clitoria Ternatea*, *Teramnus labialis*, *Mucuna pruriens*, *Dioclea reflexa*, *Canavalia ensiformis*, *Sophora tomentosa*, *Cæsalpinia Bonducella*, *Cassia occidentalis*.

Malvaceæ.—*Sida rhombifolia*, *spinosa*, *carpinifolia*, *Urena lobata*, *Hibiscus tiliaceus*.

The majority of these cosmopolitan plants are coarse-growing annuals or herbaceous perennials, with abundant flowers and copious easily-dispersed seeds. They are mostly such as grow readily in waste and open places. A few of them are shrubby plants of sea-shores, as, for instance, *Suriana maritima*, *Hibiscus tiliaceus*, and *Sophora tomentosa*. Of the flowering plants *Piper subumbellatum* is the only conspicuous instance of a plant of shady woods, but many of the cosmopolitan ferns, such as *Trichomanes radicans*, *Hymenophyllum polyanthos*, *Adiantum lunulatum*, and *Davallia Speluncæ* are of this category. In addition to these it would not be difficult to make out a list of 100 more Madagascar flowering plants that are spread widely through the tropical zone of the Old World. Amongst these latter aquatic plants are represented by such species as *Nymphæa Lotus* and *stellata*, *Limnanthemum indicum* and *Utricularia stellaris*; trees and shrubs of the muddy swamps of the sea-shore by the mangroves and their associates (such as *Rhizophora mucronata*, *Bruguiera gymnorhiza*, *Sonneratia alba*, *Lumnitzera racemosa*, *Thespesia populnea*, and *Avicennia officinalis*); and shrubs not specially maritime by such plants as *Schmidelia racemosa*, *Colubrina asiatica*, *Ormocarpum sennoides*, *Desmodium lasiocarpum* and *umbellatum*, *Premna serratifolia*, and *Securinega obovata*. As a whole, comparing Madagascar with our own colonial possessions in that region, no doubt the number of widely-spread tropical types will be found to be quite as large, but of course the proportion which they will bear to the whole flora will be much smaller, because the flora of Madagascar is so much more extensive.

The endemic element in the Flora.—I will next attempt to give as good an idea as I can in a short space of the character of the endemic element in the Madagascar flora. Bentham and Hooker, in 'Genera Plantarum,' admit 166 natural orders of Dicotyledons. Reckoning the orders of Monocotyledons on the same scale, the number will be about 40. Of these 206 natural

orders 125 are already known in Madagascar. Only one of them, *Chlænaceæ*, is regarded, so far as published material goes, as peculiar to the island, and out of its five genera we have in the Kew Herbarium specimens of two gathered by Forbes in Mozambique. *Chlænaceæ* are shrubs or small trees with alternate rigid entire leaves resembling those of the Myrtles or *Melastomaceæ*. In the structure of the flower they come nearer fhe *Malvaceæ* and *Tiliaceæ*. The ovary is three-celled, and the sepals are also only three in number, by which they can readily be recognised from all their neighbours. The stamens are usually indefinite. Three out of the five genera have a large persistent cup-like epicalyx, which in one genus is fleshy. *Rhodolæna* is a magnificent plant with a lax corymb of flowers, like those of a *Pleroma*, two or three inches in diameter, with orbicular, much imbricated, red petals. *Sarcolæna grandiflora* has a turbinate fleshy epicalyx, with white flowers a couple of inches in diameter when expanded. In *Schizolæna* there are two flowers to an involucre, and it grows out in the fruiting stage, and is laciniated at the edge like that of Cotton. In the three other genera the flowers are smaller and aggregated at the end of the branches in dense corymbose panicles. The total number of species known in Madagascar is eight or ten.

In the island altogether the number of genera now known is about 700. Of these about 80, of which the following is an approximate catalogue arranged under the natural orders, are supposed to be endemic, so far as present knowledge extends.

Menispermaceæ.—*Rhaptonema*, *Spirospermum*, *Bursaia*.
Sterculiaceæ.—*Cheirolæna*.
Tiliaceæ.—*Ropalocarpus*.
Celastraceæ.—*Ptelidium*, *Polycardia*.
Sapindaceæ.—*Macphersonia*.
Anacardiaceæ.—*Micronychia*, *Baronia*.
Leguminosæ.—*Chadsia*, *Baukea*, *Colvillea*.
Crassulaceæ.—*Kitchingia*.
Hamamelidæ.—*Dicoryphe*.
Rhizophoreæ.—*Macarisia*.
Melastomaceæ.—*Dichætanthera*, *Veprecella*, *Rousseauxia*, *Gravesia*.
Samydaceæ.—*Calantica*, *Nisa*, *Asteropeia*, *Myriantheia*.
Passifloreæ.—*Deidamia*, *Physena*.
Rubiaceæ.— *Breonia*, *Carphalia*, *Tamatavia*, *Chapeliera*, *Nematostylis*, *Leiochilus*, *Saldania*, *Hymenocnemis*.
Compositæ.—*Centauropsis*, *Rochonia*, *Glycideras*, *Henricia*, *Synchodendron*, *Syncephalum*, *Sphacophyllum*, *Micractis*, *Epallage*.
Lobeliaceæ.—*Dialypetalum*.
Myrsinaceæ.—*Oncostemon*.
Sapotaceæ.—*Cryptogyne*.
Oleaceæ.—*Noronhia*.
Apocynaceæ.—*Craspidospermum*, *Plectaneia*, *Mascarenhaisia*.
Asclepiadaceæ.—*Pentopetia*, *Camptocarpus*, *Harpanema*, *Pycnoneurum*, *Decanema*, *Pervillæa*.
Gentianaceæ.—*Tachiadenus*.
Convolvulaceæ.—*Bonamia*.

Scrophulariaceæ.—*Hydrotriche*, *Rhaphispermum*.
Acanthaceæ.—*Periblema*, *Brachystephanus*, *Lasiocladus*.
Verbenaceæ.—*Adelosa*.
Labiatæ.—*Tetradenia*.
Amarantaceæ.—*Henonia*.
Phytolaccaceæ.—*Barbenia*.
Monimiaceæ.—*Ephippiandra*.
Lauraceæ.—*Ravensara*, *Potameia*.
Proteaceæ.—*Dilobeia*.
Euphorbiaceæ.—*Leptonema*, *Cometia*, *Tannodia*, *Sphærostylis*.
Urticaceæ.—*Pachytrophe*, *Ampalis*.
Palmaceæ.—*Dypsis*.
Mucaceæ.—*Ravenalia*.
Orchideæ.—*Bicornella*.
Gramineæ.—*Maltebrunnea*.

Several of these are represented by a single species only, and none of them by more than five or six. Many of them are little known, and of several of them we have no authentically-named specimen in the Kew Herbarium. No doubt in the next ten years this list will need to be materially modified by the addition of fresh discoveries of endemic genera and by the omission of others, which, like the two genera of *Chlænaceæ*, will be discovered in the adjacent regions of Tropical Africa, the botany of which has been explored very imperfectly. The principal point of general interest to be noted about them is that they are scattered through the whole systematic series, and not concentrated in any particular order or subclass, and that a large proportion of them belong to the large natural orders, such as *Rubiaceæ*, *Compositæ*, and *Asclepiadaceæ*, and are closely allied to cosmopolitan tropical genera. A few notes on the general habit of some of the more striking types may not be out of place.

The endemic type that influences most the general physiognomy of the vegetation is the Traveller's Tree, *Ravenala madagascariensis*. It is allied to *Heliconia* and the Banana, and has a tall simple woody trunk, distichous leaves, with solitary spreading axillary distichous clusters containing about ten flowers each, large spathes, an oblique perianth-limb six or eight inches long, cut down nearly to the base into linear segments, six very long basifixed anthers, and a capsular fruit, with numerous small umbilicate seeds with a blue pulpy arillus. *Dypsis* is a palm allied to *Areca*, with pinnate leaves. *Colvillea* (figured Bot. Mag., t. 3325, 3326) is a magnificent leguminiferous plant of the suborder *Cæsalpineæ*, with bipinnate leaves, with numerous small sensitive leaflets like those of a *Mimosa*, and a dense raceme a foot long of large red flowers, with convex orbicular petals. *Bankea* is a shrubby climber allied to *Phaseolus*, with curved reddish yellow flowers above an inch long, with very acute calyx-segments, and a keel longer than the wings and standard, arranged in sparse axillary corymbs on long pedicels. *Cheirolæna* is a close ally of the nearly-extinct Blackwood and Redwood of St. Helena. It is an erect shrub with long linear leaves clothed with stellate pubescence, and a small red mallow-like flower

with lanceolate bracteoles. *Bonamia* is an erect Convolvulaceous shrub, with coriaceous, strongly-veined, oblong leaves and small flowers in a dense panicle at the end of the branches. *Bicornella*, the endemic genus of Orchids, is a small-flowered terrestrial type allied to *Habenaria* and *Satyrium*. *Tachiadenus* is a blue gentian, with a hypocrateriform corolla like that of a large *Vinca*, with a tube in one of the species four inches in length, and a flat limb a couple of inches in diameter. *Mascarenhaisia* is allied to *Echites*, but is not scandent. The flower is rather like that of *Tachiadenus*, in one species of a brilliant crimson, with a long tube twice as thick in the upper part as in the lower. The Kitchingias are showy succulent plants allied to *Bryophyllum* and *Cotyledon*, with corymbs of bright red middle-sized tubular flowers. *Deidamia* is a passion-flower with pinnate leaves, flowers as large as those of a buttercup, arranged in lax axillary corymbs, a rudimentary corona, and a baccate fruit the size of a greengage plum. *Dicoryphe* has the habit of *Cestrum*, with large stipules, dense terminal corymbs, flowers like of a *Lythrum* or *Cuphea*, with a long calyx-tube with five small petals inserted at its throat and hidden stamens. *Astelopeia*, of which the ordinal position is doubtful between *Samydaceæ* and *Linaceæ*, is a shrub with crowded entire leaves, copious small flowers in dense terminal corymbs, coriaceous persistent petals, 10 hypogynous stamens, and a 3-celled syncarpous ovary.

(To be continued.)

A BOTANICAL RAMBLE ALONG THE SLANEY AND UP THE EAST COAST OF WEXFORD.

By Henry Chichester Hart, B.A.

In June and July last I spent several days in a botanical exploration of the River Slaney, starting at its source and turning northwards from its mouth, up the coast of Wexford, to Arklow. I met with a good number of unnoticed varieties, and noted carefully the distribution in the district of some of the rarest Irish plants, as *Mathiola sinuata*, *Juncus acutus*, &c. I will give an account of my observations in the order in which they were made.

On the 12th of June, having crossed the eastern shoulder of Lugnaquilia and descended a few hundred feet, I struck the southern rivulet, which at a lower elevation is called the Little Slaney; it is an uninteresting and tortuous stream, running amongst stony banks for the first few miles. About half-way down this southern slope of Lugnaquilia, above Coolmoney, I found upon rocks in the river-bed a small patch of *Hieracium anglicum*, a hawkweed which has not been gathered previously in the Wicklow district. At the base of the steeper part of the descent many common sedges appear abundantly, and it is noticeable how these prevail along the river-banks in the poorer, upland soil. In the lowlands, from Baltinglass southwards, the change to the larger river-plants and grasses is well-marked. The sedges noted were,

Carex pulicaris, *C. stellulata*, *C. flava*, *C. ovalis*, *C. vulgaris*, *C. glauca*, *C. panicea*, *C. hirta*, and *C. acuta*; the two latter were the last to appear, ranging from about Coolmoney to Baltinglass, near which the last disappeared. As the river widened and deepened, *Ranunculus floribundus* becomes abundant, and continues so throughout its course; by the banks of the stream above Davistown I gathered *Equisetum hyemale* in two or three places, and on the edge of a corn-field *Lamium intermedium*. This part of the river is of little interest and no beauty, and the inn at the town of Baltinglass where I was compelled to pass the night will by no means invite a second visit.

On the 13th of June I followed the left bank of the river, which had now assumed considerable dimensions. Close to the village is a plentiful colony of *Geum rivale* drooping gracefully over the stream. After a while the larger river-plants fringe the banks, while the country becomes rich and pastoral in its character. Sedges are fewer in kind, but *C. hirta* and *C. acuta* are both luxuriant and frequent; *Eupatorium cannabinum*, *Phalaris arundinacea*, and the larger willow herbs (*Epilobium hirsutum* and *E. parviflorum*) line the borders, while in the stream itself *Potamogeton crispus* and *P. heterophyllus* (scarce) appear in company with the large-flowered water-crowfoot, *Ranunculus floribundus*. At Tullow, where I left off for a time, the scenery becomes prettily wooded and undulating, and the exploration much more agreeable. In the neighbourhood of Carlow, about nine miles westward, I noticed *Anthriscus vulgaris*, *Euonymus europæus*, and *Orchis pyramidalis*.

On the 5th of July I resumed my walk along the left bank of the river at Tullow. Here sedges have almost entirely disappeared. A little below Tullow I observed *Orchis pyramidalis*, *Arabis hirsuta*, *Ononis arvensis*, *Potamogeton lucens*, *Festuca arundinacea*, *Lepidium Smithii*, and **Saponaria officinalis*; a couple of miles lower, *Inula dysenterica*, *Œnanthe crocata*, and *Carex acuta* are common; while the very ornamental *Ranunculus floribundus* fills the stream in still places with its cushions of intensely dark, star-sprinkled green. At Aghade the woody banks by the Slaney present a more varied and interesting flora; the thickets are tangled with *Rosa arvensis*; on the ditch-banks *Equisetum maximum* and *Allium vineale* catch the eye, while both the prickly shield-ferns, *Polystichum aculeatum* (rarely) and *P. angulare*, are to be met with. At Ballintemple the river is beautiful, passing through a long well-wooded glen rich in shelter-loving vegetation. Notwithstanding two conspicuous notices to trespassers, I thought this the most interesting reach in the river; it must be a rare spot for the angler, while the sides of the valley, not near enough to shut out the sunshine, are sufficiently steep and wooded to give plentiful variety of light, form and shade. The banks here are densely covered with *Petasites vulgaris*, the leaves of which are so useful in an artist's foreground. A little aside, in the shade, *Alliaria officinalis* and *Triticum caninum* are plentiful; *Euonymus europæus*, *Agrimonia Eupatoria*, *Malva moschata*, and *Carex læviyata* were also gathered here; in my opinion the

latter is one of the showiest and prettiest of all wild flowers; I noticed it in many places along the Slaney. The stream itself is here lined with a hedge of the larger plants already mentioned. In gravelly places, a little below Ballintemple, I noticed *Verbascum Thapsus*, *Reseda Luteola*, *Carduus tenuiflorus* (a long way inland for this plant), *Carlina vulgaris*, *Origanum vulgare*, *Phleum pratense*, and *Lychnis Githago*, in company with *Orchis pyramidalis* and *Malva moschata*. Near Clonegall I gathered *Hypericum dubium*, *H. perforatum*, *Geranium dissectum*, *Poa rigida*, *Symphytum officinale*, and *Orobanche minor*; the latter, which has not been fully admitted into the Irish Flora, was here plentiful upon clover; I noticed it afterwards commonly in several places in Wexford. A little below Clonegall, by the left bank of the river, *Hieracium boreale* occurs sparingly, and in a corn-field I gathered *Valerianella dentata*. Here also by the stream was *Rumex Hydrolapathum*, afterwards plentiful down the Slaney. About three miles from Newtown-barry the river becomes the boundary between Carlow and Wexford; the left bank, which I followed, lies in the latter county. Newtown-barry is a pretty little village, but I cannot praise the inn; I even wished I was back for the night in Baltinglass.

July 6th. Along the left bank of the river, close to the village, there is an abundance of *Malva moschata*, and, a little farther on, *Hypericum dubium*, *Origanum vulgare*, *Verbascum Thapsus*, and *Tanacetum vulgare*; in a pond at Clohamon Mill, *Sparganium minimum* and *Helosciadium nodiflorum* are plentiful. About a mile below Clohamon, *Sparganium simplex* occurs with these last, and here also, on dry gravel banks close by the river, there is a considerable growth of *Viola hirta*. In the river, *Potamogeton perfoliatus* and *Polygonium amphibium* are plentiful, and a little farther on by its edge is *Nasturtium palustre*. About a mile above Ballycarney, a village half-way (five miles) from Newtown-barry to Enniscorthy, I met with abundance of *Orobanche minor* in a clover-field between the road and the river, close to Mountfinn House. Near Ballycarney I noticed *Euphorbia exigua*, *Valerianella dentata*, *Polystichum angulare*, and **Saponaria officinalis*; and by the river, a little farther on, *Lycopus europæus*, afterwards frequent. Near Scarawash Bridge I again met with *Orobanche minor*. In this part of the river the pearl-mussel (*Unio margaritaceus*) appears to be very abundant, and is collected for the sake of the pearls. At the point where the railway approaches the stream I noticed *Equisetum hyemale*, *Carex paniculata*, *C. acuta*, and *Osmunda regalis*. Near Enniscorthy *Convolvulus arvensis* occurs, and in it I gathered *Lamium album*, *Chenopodium Bonus-Henricus*, and *Elodea canadensis* (its first appearance in the river). At Enniscorthy I crossed to the right bank of the river. From this point the tide exercises an influence, and I watched for the first appearance of estuary plants. In deep dykes between the railway and the river, *Carex riparia*, the largest Irish sedge, was very conspicuous about a mile from the village, and near it was *Œnanthe fistulosa*, *Nasturtium palustre*, and *Carex vesicaria*; the latter occurred abundantly a mile lower in

heavy swamps by the river, and these last two sedges appear profusely in deep water-courses running from the railway to the river farther on. Deep and treacherous bog-holes and swamps make travelling difficult and dangerous along this part of the Slaney; a couple of alarming immersions drove me to take refuge on the railway-banks, but an unsympathizing gaffer differed with me there about the rights of botanists. Evading his observation for a time, I plunged again into the marsh, which was chiefly composed of *Rumex Hydrolapathum*, *Arundo Phragmites*, *Pedicularis palustris*, and *Scirpus lacustris*. This was a little past Edermine Station. Here also was abundance of *Solanum Dulcamara* and *Carex paniculata* with its dense tussock-forming roots. *Typha latifolia*, *Carex vulpina*, *C. ampullacea*, *Equisetum maximum*, *Lycopus europæus*, and *Scrophularia aquatica* were also comman. The first genuine salt-marsh plants to appear are *Scirpus maritimus* and *Œnanthe Lachenalii*: while *Glaux maritima* and *Cochlearia officinalis* soon prevail. By or near the railway-banks, and in gravel-pits and fields between Macmine Junction and Killurin, I gathered the following rarer plants:—*Scutellaria galericulata*, *Echium vulgare*, *Allium vineale*, *Ceterach officinarum*, and *Gnaphalium minimum*. It was dusk when I reached Killurin, and I took train thence to Wexford, a distance of about six miles along the shore of a wide flat estuary.

July 7th. Having passed the night in a comfortable hotel at Wexford, a happy contrast to my previous experiences, I took ferry across the harbour to the sand-hills. I spent several hours here, and along an embankment, making my way to Raven Point. In waste ground across the ferry I noticed *Apium graveolens*, *Senebiera Coronopus*, *Ranunculus sceleratus*, *Stachys arvensis*, *Leontodon hirtum*, and *Chenopodium rubrum*. Wending eastwards, towards the embankment and along it, *Euphorbia Paralias*, *Psamma arenaria*, *Triticum junceum*, and *Elymus arenarius* become frequent; and a little farther on these are accompanied by *Festuca arundinacea*, *Carex distans*, *C. extensa*, *Beta maritima*, and a profusion of Atriplices, *A. littoralis*, *A. Babingtonii*, *A. deltoidea*, &c. Here also are **Cichorium Intybus*, ‡*Lavatera arborea*, and the sand-hill form of *Equisetum hyemale* (var. *Moorei*). Near the end of the embankment, on the northern side, *Juncus acutus* occurs for the first time; *Juncus maritimus*, *Scirpus Savii*, *Potamogeton pusillus*, and *Blysmus rufus* occur close by. Amongst the sand-hills at Raven Point I observed *Habenaria viridis*, *Viola Curtisii*, *Gentiana campestris*, *Euphorbia portlandica*, *Epipactis palustris*, *Phleum arenarium*, *Samolus Valerandi*, *Festuca uniglumis*, *Lycopsis arvensis*, *Cakile maritima*, *Eryngium maritimum*, &c. There were sheets of the handsome *Epipactis* in flower, and it reappeared frequently as far as Cahore Point. At Curracloa *Juncus acutus* is plentiful, and its leaves are commonly variegated with alternating bands of black and green. Here there is a large floating bog overgrown with reeds and aquatic plants. I discovered that it was floating only by stepping to it from a low bank, to gather *Sium angustifolium*, when I immediately shot through the raft. With *Sium*, *Rumex Hydro-*

lapathum is also abundant; and on dry banks near by are *Listera ovata* and **Pastinaca sativa*. Near this, by the shore, amongst sand-hills, is a quaint little group of clean and picturesque little cottages. The sand-hills are close, bare of vegetation, and considerably higher than their roofs, so that one comes on them quite unexpectedly; when the wind blows, each cottage fills with sand, and at every door stands a large shovel to empty it out again. Outside these sand-hills, which extend for a mile or so farther north, is a hard sandy beach stretching along a great part of the coast of Wexford, and affording in most places, as at Curracloa and Blackwater, capital sea-bathing. Where the sand-hills end, steep marl-banks begin, which form a bank from thirty to over a hundred feet above the beach, and extend nearly to Cahore Point, about fifteen miles north. This coast-line of excellent soil is being swallowed up at the rate of a strip two to five yards wide per annum. Coast-guard stations and potato-gardens, arable land and pasture are all carried away into the Irish Sea. A station which was put up, as I was informed, in 1862 at a place called Morris Castle, stood at that time a hundred yards from the shore; the front door is now only twenty-five yards from the brink. A new piece of ground was promised when that station disappeared; unfortunately, however, the coast-guards were allowed the frontage alone for potato-gardens, most of which has disappeared. Between Curracloa and Blackwater I noticed *Linum angustifolium* and *Convolvulus arvensis*. At Ballyconigar or Blackwater Head, a higher eminence in the marl-bank, south of a small stream, I first met with *Mathiola sinuata*. It was in full bloom, and the hoary glaucous foliage forms a beautiful contrast with the rich purple blossoms. This, which is one of the rarest Irish plants, was previously known from this locality. By the small stream here I noticed *Chlora perfoliata*, *Equisetum Moorei*, *Gnaphalium germanicum*, and *Poa aquatica*. About four and a half miles north of this point, near Tinnyberna, on a headland by the sea, I met with *Mathiola sinuata* again, with *Silene anglica*. *Reseda lutea*, *Torilis nodosa*, *Carduus nutans*, and *Stachys arvensis*, all rare plants in Ireland and not previously noticed in this locality. Here I struck three or four miles inland, and obtained accommodation for the night at Kilmuckridge.

July 8th. Made my way down to the coast by the small stream running south from Kilmuckridge. About a mile from the shore I noticed *Carex ovalis*, and a little lower down is a colony of **Humulus Lupulus* thoroughly established on banks apart from present cultivation. On a high marl-bank by the sea, south-east from Kilmuckridge and about five miles north of the last district, *Mathiola sinuata* appears again, and in greater quantity than in either of the previous localities. Along the sea-banks here, *Agrimonia Eupatoria*, *Chlora perfoliata*, and *Leontodon hirtum* are common. Here, too, upon clover (*Trifolium pratense*) by the coast, I again noticed *Orobanche minor*. This clover, apparently native, is one of the most abundant plants all along these marl-banks both outside and upon the boundary ditches; and the appearance of the

Orobanche in such circumstances will, I believe, fully establish its claims as a colonist to a place in the Irish Flora. Between Kilmuckridge and the Coast-guard Station at Morris Castle I noticed also *Equisetum maximum*, *Carex riparia*, and *Rubus cæsius*. A little north of Morris Castle is a lonely marshy lake studded with islets, the breeding haunt of many wild-fowl, as terns, teal, ducks, redshanks, and others. *Scirpus Tabernæmontani*, *Œnanthe Lachenalii*, *Carex ovalis*, *C. vulpina*, *C. stricta*, and *Poa aquatica* grow here abundantly. About a mile beyond Morris Castle sand-hills again occupy the coast-line, and with these reappears *Juncus acutus* in profusion. Both here and at Raven Point it reaches a much greater size than at Arklow; here especially, where it is very plentiful for a couple of miles, it is frequently five or six feet high. This station, perhaps the most considerable in Ireland, lies about one to three miles south of Cahore Point. Amongst these sand-hills I gathered *Epipactis palustris*, *Equisetum Moorei*, *Euphorbia portlandica*, *E. Paralias*, *Thalictrum minus* (var. *maritimum*), *Rubus cæsius*, *Festuca uniglumis*, *Triodia decumbens*, *Phleum arenarium*, and other sand-hill plants in plenty. About half a mile south of Cahore Point *Cynoglossum officinale* grows freely, and with it *Malva moschata*, *Carlina vulgaris*, and *Senecio Jacobæa* var. *flosculosus*. Here *Juncus acutus* ceases for the present. On an island rock outside a point a little north of Cahore Point is a patch of *Obione portulacoides*, a very rare and local plant in Ireland. It was previously known very sparingly on the Dublin and Waterford coasts; this forms an intermediate station. Between this and Courtown the coast is for the most part low and sandy, and yields nothing worthy of note. *Thalictrum maritimum* occurs in many places; in the demesne at Courtown *Carex pendula* is common. Between Courtown and Gorey I gathered *Trifolium medium*. From Gorey I left by rail for Dublin.

July 11th. After a couple of days I resumed my walk at Courtown, a pretty little bathing-place with a small harbour and an open sea. By the shore, along sand-hills, *Hippophae rhamnoides* is abundantly established, forming in some places impervious thickets. It extends for about three-quarters of a mile north of Courtown Harbour, fringing the sea-edge of the Earl of Courtown's demesne, and ceasing there, with the exception of a small isolated patch by a cottage half a mile farther on at Duffcarrig. This plant, which is nowhere native in Ireland, has been stated to grow at Raven Point, near Wexford, but I did not observe it. (See 'Recent Additions to the Flora of Ireland,' by A. G. More, p. 28). Amongst these sand-hills appeared *Convolvulus Soldanella* in beautiful profusion, and in thickets close by the pink-flowered variety of *C. sepium* occurs. *Thalictrum maritimum*, *Festuca uniglumis*, and *Orchis pyramidalis* are still frequent, and *Crithmum maritimum* occurs on low stony banks by the sea. In the bottom of a wooded glen, a little south of Duffcarrig rocks, *Carex pendula* and *C. remota* occur, while *Vicia sylvatica* covers and decorates the banks of brambles along its sides. By the shore north of this, near Ballymoney, *Cynoglossum officinale* and *Viola Curtisii* occur commonly.

At the north of a river about half-way between Courtown and Kilmichael Point *Juncus acutus* appears again. Near Kilmichael Point I gathered **Fœniculum vulgare*, **Lavatera arborea*; most of the sand-hill plants already mentioned still occur, and at Arklow Head *Vinca major* is thoroughly established by deserted cottages. *Vicia sylvatica*, *V. angustifolia*, *V. hirsuta*, *Trifolium arvense*, *Osmunda regalis*, *Asplenium marinum*, *Euphorbia portlandica*, *Crithmum maritimum*, and *Orobanche Hederæ* were also noted at Arklow Head; while on sandy wastes immediately north of it *Juncus acutus* appears again, though very much smaller than the Cahore and Raven Point plant.

From Arklow to Dublin the coast has been well examined, so here my explorations ceased. In the forgoing *resumé* will be found many new localities for rarer Irish plants. Some of these plants had previously been noticed in other parts of the districts ("3" and "4" of the 'Cybele Hibernica') in which they occur. The following is a list of those which had not been previously noted in their respective districts; it is unnecessary to repeat the exact localities:—

Ranunculus floribundus, Bab. Districts 3 and 4.
Viola hirta, Linn. D. 4.
**Lavatera arborea*, Linn. D. 4.
Rubus cæsius, Linn. D. 4.
Hieracium anglicum, Fries. D. 4.
H. boreale, Fries. D. 3.
Carduus nutans, Linn. D. 4.
Orobanche minor, Linn. D. 3 & 4.
Lamium intermedium, Fries. D. 4.
Chenopodium rubrum, Linn. D. 4.
Obione portulacoides, Moq. D. 4.
Rumex Hydrolapathum, Huds. D. 3.
Blysmus rufus, Panz. D. 4.
Carex acuta, Linn. D. 3 and 4.
C. vesicaria, Linn. D. 4.
Festuca arundinacea, Schreb. D. 3.

SHORT NOTES.

Potamogeton heterophyllus, Schreb., *var.* pseudo-nitens, mihi. —Last August, when collecting with my friend Mr. Beeby in Surrey and N. Hants, we found in the Basingstoke Canal, near Aldershot, Surrey, several patches of a remarkable *Potamogeton*. As seen in the water the plant had the appearance of *P. nitens*, Weber (*P. curvifolius*, Hartm.); and the similarity was so great that had it been in a Scotch loch we should have at first sight considered it that plant. It has numerous slender stems, brownish orange on the main stems, red on the stolons (semi-transparent); leaves mostly semi-amplexicaul, the upper ones with a petiole (not coriaceous); stipules evenly veined, those at the base of the peduncles less inflated than *heterophyllus*; peduncles slender, and spikes shorter than typical *heterophyllus*: in all these characters agreeing rather with *nitens*. We found immature fruit only. I have seen nothing like it from Europe or N. America, and as it seems worth a varietal name I propose the above for it, to show its affinity

with *nitens*. I hope to obtain it next year, and watch it under cultivation. It is entirely different from the plant distributed through the Exchange Club by Dr. Boswell from Orkney, namely, "*P. heterophyllus*, with broad-based lower leaves." In the same canal (Surrey and Hants) occurred *P. pusillus* var. *tenuissimus*, Fries, in large patches; its beautiful deep green colour made it distinguishable at some distance from ordinary *pusillus*. Here it showed no approach to the type, but had very narrow tapering leaves, much like those of *P. rutilus*, Wolfg., on a small scale.—Arthur Bennett.

Pyrus latifolia, Syme, in East Cornwall.—*Pyrus latifolia*, Syme, must be added to the list of species found in Cornwall. On October 12th my brother, Lieut.-Col. J. A. J. Briggs, brought me specimens, some with fully-formed fruit, that he had that day gathered at Beardown, in the parish of Boyton, E. Cornwall, about seven miles from Launceston. He informs me he saw bushes in hedgerows in several spots. The locality of course belongs to vice-county 2 of Watson's 'Topographical Botany,' and is about twenty miles from the nearest of the Plymouth stations for this species, and about double that distance from its North Devon one near Linton; but so very little is known of most of the botany of the tract of country coming in between Boyton and Linton that it is very likely the shrub occurs in intermediate places. Its ascertained range in the South of England must now stand as from v.-c. 2–6 inclusive, together with 34 (Gloucester west), as appears by 'Topographical Botany,' p. 622. Here Mr. Watson quotes Dr. Boswell as saying, "in letter, Dec. 1873," that he suspects *latifolia* and *Mougeotii* are but the extreme forms of a series of hybrids between *Aria* and *torminalis*. As regards *latifolia*, its distribution in Devon and Cornwall is such as to lend no support to the view of its being a hybrid production. At the places where I have seen it *P. Aria* is not found in an indigenous state, and is not common in cultivation; whilst *P. torminalis* is but sparsely scattered over the country generally, and is not known to grow anywhere intermixed with *P. latifolia*. Moreover, I have found seeds of *latifolia* vegetate freely, which, to say the least, is not often the case with those of hybrid plants.—T. R. Archer Briggs.

Rare English and Irish Plants.—A rose which I gathered last June in Portumna demesne, Co. Galway, is pronounced by Mr. Baker to be a form of *Rosa sepium* nearly identical with the Allesley plant. This species has not hitherto been recorded as Irish. In the same place I got *Rosa rubiginosa* and *Chara aspera* var. *curta* (*fide* Groves). I saw several hundred specimens of *Inula salicina*, but all barren; I traced it for at least four miles down the shore of Lough Derg. On June 17th, at Brandon, I gathered a few specimens of *Aira alpina*, at about 2700 feet, in a ravine on the east side. I send specimens of some other rare plants for which the following stations have not been recorded;—*Cystopteris montana*, Helvellyn, about a dozen plants, at about 2700 feet. *Salix*

Lapponum, Helvellyn, a single rather large plant, growing in a conspicuous position near one of the beaten tracts; was it planted? *Scirpus parvulus*, in several places on the shores of Christchurch harbour, S. Hants, but very rarely flowering. *Sonchus palustris*, in backwaters of the Medway near Aylesford, in one place in tolerable abundance. *Chara canescens* (*fide* Groves), Little Sea, Studland, Dorset, 1879.—Bolton King.

Extracts and Notices of Books and Memoirs.

EXTRACTS FROM THE REPORT FOR 1880 *OF THE BOTANICAL EXCHANGE CLUB OF THE BRITISH ISLES.*

[Edited by Mr. James Groves].

(Concluded from p. 317.)

P. heterophyllus, Schreb., form with broad-based submerged leaves. Kirbister Loch, Orkney, July, 1875.—J. T. Boswell.

P. pectinatus, L., *genuinus*.—Loch of Kirbister, Orphir, Orkney, August, 1880.—J. T. Boswell.

P. filiformis, Nolte.—Mud at bottom of brackish water near the Bridge of Brogar, Loch of Harray, Orkney, 24th September, 1880.—H. Halcro Johnston.

Zannichellia polycarpa, Nolte, var. *tenuissima*, Fries.—Kirbister Loch, Orphir, Orkney, August, 1880.—J. T. Boswell.

Ruppia rostellata, Koch, var. *nana*, Bosw.—In the Oyce of Firth, Orkney, August, 1880. Stem creeping, wholly buried in the mud, which is covered by the sea at high water. Peduncles very short, curving downwards, so as to bury the fruit in the silt; stalks of the nuts usually shorter than in the ordinary form of *R. rostellata*, but many times longer than the nuts; nuts very oblique and rostrate, as in *R. rostellata;* leaves setaceous; sheaths not swollen. This plant is much like No. 205 of Balansa's 'Plantes d'Algérie,' 1852, named *R. maritima*, var. *acaulis*, J. Gay, from 'Bords de la Macta, dans une mare d'eau salée,' but that has the nuts nearly regular, greatly swollen, and not rostrate; indeed, they are very like those of *R. Drepanensis*, Tineo, which I have from Sicily. The Orkney plant has some resemblance to *R. brachypus*, Gay, but has shorter stems, narrower sheaths, and much longer stalks to the nuts, which are less swollen and distinctly rostrate.—John T. Boswell.

Zostera angustifolia, Reich.—Oyce of Firth, Orkney, August and September, 1880.—J. T. Boswell and H. Halcro Johnston.

Iris Pseudacorus, L.—Swampy meadow, Kelvedon, Essex, June, 1880.—E. G. Varenne. This appears to me to be the *I. pseudo-Acorus*, Boreau, Flore du Centre, 3me éd., tome ii., p. 635. 'Botanical Exchange Club Report,' 1878, p. 19. *I. acoriformis*, Bor., the more widely-distributed and common form, is readily (as far as my experience goes) distinguished by the different colour

and shape of its outer perianth-segments and the much broader stigmas. To do justice to the critical forms of *Iris*, a flower, to accompany each specimen, should be pulled to pieces, and the perianth-segments, stigmas, &c., dried separately.—Geo. Nicholson.

Carex fulva, Good., var. *sterilis*, E. B., ed. iii.—Swanbister, Orphir, Orkney, August, 1880.—J. T. Boswell.

Spartina Townsendi, H. and J. Groves.—Plant 1½–4 feet high. Leaves falling short of the spikes; lamina almost flat, broadest at the base, jointed to the sheath. Spikes usually 4–9, somewhat spreading, 4–7 inches long; spikelets 15–30, imbricate, but not crowded; glumes slightly hairy on the keel; rachis exceeding the last spikelet. This is the plant referred to by us in the 'Journal of Botany' for 1879, p. 277, as a form of *S. stricta*; it, however, occupies so intermediate a position between that species and *S. alternifolia*, that it appears desirable not to include it under either. *S. Townsendi* differs from *S. alterniflora* by its more slender stem, leaves falling short of the spikes, and the laminæ being jointed to the sheaths; from *S. stricta* by its much greater size, longer and more numerous spikes, and by the rachis much exceeding the last spikelet. It grows in denser patches than either, and is noticeable among the *alterniflora* by its taller stems and yellower flowers. Our plant agrees in some respects with the *S. stricta*, var. *glabra*, of Asa Gray's 'Manual;' from Muhlenberg's description, we think his *S. glabra* should be referred to *S. alterniflora*, but have seen no specimens. Mud flats, near Hythe, South Hants.—H. and J. Groves.

Aira ——. Ben Voirlich, Perthshire, 1878.—J. Cosmo Melvill. *A. flexuosa*, a very interesting form; it has three perfect flowers in a spikelet, and I never saw such a thing before. In the sections of *Aira* as characterised in the English Botany, &c., the mark most insisted upon is that *Deschampsia* has two perfect flowers and a rudimentary third, and that in *Avenella* (*flexuosa*) the rudimentary third is absent; in this specimen it is not only present, but fully developed.—J. G. Baker.

Bromus asper, Murr., approaching *Benekenii*.—Limestone woods, Great Doward, Herefordshire, 27th July, 1880. This variety of *asper*, whether *Benekenii* or not, is distinguishable at a glance from the ordinary form, and, when growing together, subject to the same conditions of light and moisture, it is uniformly about a week in advance of the ordinary form. I have never noticed any intermediates, although having come across the variety at as many as ten different stations in Herefordshire and other counties during the last few years, unless weak panicles of *asper*, thrown up in late autumn, are to be counted so. These often have the upper sheath glabrous, and the lower panicle branches, which are seldom more than two, curved upwards, as in var. *Benekenii*, not divaricate nor deflexed as in ordinary *asper*. Has any botanist noticed the "little scale" mentioned by Dr. Trimen, in Journ. Bot., n.s., vol. x., p. 333, as supporting the ramifications of the inflorescence in these two grasses? I have repeatedly searched for it, and only once discovered it in ordinary *asper*, when it answered admirably to the

description there quoted from Lange; never in the present variety. —Augustin Ley. I have read over the Rev. Augustin Ley's notes, and in them I see he says that in late autumn weak panicles of *asper* often have the upper sheath glabrous; if this be so, I think we must abandon *Benekenii* as a possible subspecies, as it is the only character I have found which is not variable in plants raised from seeds from the same individual plant.—J. T. Boswell. This seems to show that *Benekenii* is not worth attention, unless it is something unknown to me.—C. C. Babington.

Asplenium germanicum, Weiss.—Pass of Llanberis, June, 1871. This is not the Swiss plant that goes by the name *A. germanicum* or *A. alternifolium*, which is brittle and more slender, has generally an upright growth, and is surrounded by a thick girth of the stumps of last year's fronds; it is also of a dull green. The Llanberis plant is somewhat tough and broader, and the fronds arch away from the centre, and are varnished like *A. septentrionale*. I saw no surrounding of old broken-off fronds. On taking the Llanberis plant to Kew, a good many years ago, I found it was known as *A. Breynii* at the beginning of this century.—T. Butler. Just half-way between type *germanicum* and type *Ruta-muraria*.—J. G. Baker. *A. Ruta-muraria*, var. *pseudo-germanicum*, Milde!—J. T. Boswell.

Isoetes Morei, D. Moore.—Lough Bray, Co. Wicklow, October, 1880.—Fred. Moore. Ought never to have been named as a species; it is only an interesting form of *I. lacustris*.—C. C. Babington.

Chara vulgaris, L., var. *longibracteata*.—Small pond near Shalfleet, Isle of Wight, October, 1880.—George Nicholson.

C. fragilis, Desv., var. *Hedwigii*.—Kingston, Surrey, October, 1880.—George Nicholson.

Nitella gracilis, Ag.—Mr. Nicholson has collected a small piece of a plant, which is apparently a large form of this species, among *C. fragilis*, *Hedwigii*, at Kingston. This is a very interesting discovery, as the plant has not been found in England for many years, and is probably extinct in Borrer's Sussex locality.—J. G.

Symphytum "peregrinum, Ledeb.," Baker. (*S. uplandicum*, Nyman. *S. orientale*, Fries (non Linn.) *S. Donii*, DC.? See 'Reports, Botanical Exchange Club,' 1878, p. 17, and 1879, p. 23.) Plentiful on the sides of a brook in the upper part of the Via Gellia, a quarter of a mile below Grange Mill, between Cromford and Winster, Derbyshire, 26th June, 1880.—Charles Bailey.

S. orientale, L.—Railway bank, Richmond, Surrey, 20th May, 1880.—George Nicholson.

Luzula albida, DC.—This plant was found in 1879, on a bank near Bletchingley, Surrey, by Mr. William Mitten, who recorded it in the 'Gardeners' Chronicle' for July 5th, 1879, and stated that he considered "its further discovery almost a certainty" on the moist shaded banks about Reigate. Having been favoured with the exact locality, I visited the spot, but, after several hours' search in the neighbourhood, could see nothing but Mr. Mitten's original tuft. A lengthened residence in Reigate during the early

summer of 1879, and frequent visits since, lead me to conclude that the plant does not occur elsewhere in the district, and I think it undoubtedly a casual. On visiting the spot this year (1880) I could not see the tuft, which would seem to have disappeared.—W. H. Beeby.

Carex vulpinoidea, Michx.—Near the Thames, Kew, Surrey, June, 1880.—George Nicholson.

Botany for High Schools and Colleges. By Charles E. Bessey, M.Sc., Ph.D. New York: Henry Holt & Co. 8vo, pp. x., 611.

We regret that we are unable to find space for a detailed notice of this valuable addition to our stock of introductory manuals. Dr. Bessey occupies a leading position among the younger American botanists; but the present is, so far as we are aware, his first considerable contribution to botanical literature. It is divided into two parts, the first dealing with general, the second with special, Anatomy and Physiology. The first part follows Sachs' 'Lehrbuch' in general plan, with sufficient deviation, however, to show that Dr. Bessey is no mere copyist; the second corresponds more nearly, so far as the higher plants are concerned, with the arrangement of Sir J. D. Hooker as outlined in the English edition of Le Maout and Decaisne's 'Traité Générale.' In this part Dr. Bessey introduces what he terms a "a considerable alteration," that of "raising the Protophyta, Zygosporeæ, Oosporeæ, and Carposporeæ to the dignity of Primary Divisions of the Vegetable Kingdom, co-ordinate with the Bryophyta, Pteridophyta, and Phanerogamia." He, however, allows the retention of the term Thallophyta, "to designate a great assemblage of the lower plants," although the four groups above named are separately, and considering the size of the book very fully, described. It is evident that much care has been taken to bring the work up to the dates and data; the summaries of the orders are very well done, giving much information in a small space; and the structural portion of the book is clearly written and well illustrated. To say that we not unfrequently encounter terms with which we are unfamiliar is simply to say that this volume partakes of the character of all modern scientific works: whether the gain is in all cases adequate to the inconvenience of a very large vocabulary seems to us a little questionable. We can recommend the volume as a high-class book containing in a handy form the most recent information suitably illustrated.

J. B.

Two little volumes may be added to the already large list of books upon British Ferns. Mr. F. G. Heath issues 'Where to find Ferns,' but we do not think he will thereby add to his reputation. There seems indeed nothing in it which has not been already said by him in his earlier Fern-books; nor do we see how it differs from many other books of the kind, although "the author is unaware of the existence of any similar volume with just the aim of

this one." A list of the counties in which each species is found has been transcribed from 'Topographical Botany,' but this gives little information to the collector; while the chapter on 'Ferns round London' seems to have been compiled from various local floras.

Miss M. S. Ridley's 'Pocket Guide to Ferns' gives in tabular form the leading characters of each species, and is a more useful book than the foregoing. The tabular portion, indeed, is carefully done; but the introductory matter cannot be considered satisfactory. The chapter on the 'General Divisions of Flowerless Plants,' for example, conveys scarcely any information; we do not think the lichens are satisfactorily defined as "chiefly little gray silvery-looking plants, growing on the bark of trees, &c.' Nor do we think that "experienced botanists" "are in the habit of advertising fern collections for sale in 'The Exchange and Mart.' Miss Ridley has taken almost too much pains to make matters plain: most people know that "triangular is of the shape of a triangle."

We are glad to announce the publication of the physiological portion of Just's invaluable 'Botanischer Jahrbucher,' bringing the work down to the end of 1878.

The recently issued part (No. 93) of Baron von Mueller's 'Fragmenta Phytographiæ Australiæ' contains some interesting novelties. A hybrid *Lasiopetalum* (*L. Teppei* = *L. discolor* × *L. Baueri*) is noteworthy on account of the rarity of hybridity in the *Sterculiaceæ*; the discovery of an *Agonis* (*A. Scortechiniana*) in Stradbroke Island extends the range of the genus from South-West Australia to Queensland; and *Nipa fruticans* is added to the Australian Flora. Whether the learned Baron's substitution of *Commerconia* and *Ruelingia* for *Commersonia* and *Rulingia* will meet with general acceptance seems to us doubtful, nor are we convinced of its desirability.

To the same eminent botanist we are indebted for 'A Catalogue of the Plants collected during Mr. Alexander Forrest's Geographical Exploration of North-West Australia in 1879'; and for the description of a handsome new *Aristotelia* (*A. Braithwaitei*) from the New Hebrides, the latter extracted from the 'Southern Science Record' for August last.

We have received the first part, containing the *Thalamifloræ*, of the 'Flora of the Bristol Coal-field,' which was referred to at p. 224 as about to appear. It seems very carefully done, and is likely to prove an acceptable addition to our list of local floras.

The 'Catalogue of the Phænogamous and Vascular Cryptogamous Plants of Indiana,' which has been appearing in monthly instalments as a supplement to Coulter's 'Botanical Gazette,' has been issued by its authors (Messrs. Coulter and C. R. Barnes) in pamphlet form.

We have received the Report of the Botanical and Horticultural Congress held at Brussels in 1880. The principal botanical papers

contained in it are "Researches on the influence of light upon the coloration of leaves," by E. Pyneart; "Notice of the *Hederaceæ* collected by André in New Grenada, Ecuador, and Peru," by E. Marchal, *Oreopanax Andreanum* and *Sciadophyllum Planchonianum* being new species; "On the querciform leaves from the gravel at Aix-la-Chapelle," by M. Debey, for which the genus *Dryophyllum* is established, fifteen species being described and figured.

We are glad to notice that Mr. W. R. Gerard is urging upon the readers of the Bulletin of the Torrey Botanical Club the desirability of collecting the popular names of North American plants, with a view to publishing the same in the Bulletin when sufficient material has been collected.

Articles in Journals.—September.

Annales des Sciences Naturelles (tom. xi., no. 3, dated June).—P. Sagot, 'Catalogue of French Guiana Plants' (*Salacia rugulosa* and *S. parviflora*, sp. nn.)—J. Vesque, 'On some local formations of Cellulose' (1 tab.)—J. D'Arbaumont, 'The Stems of *Ampelideæ*' (4 tab.)———(Sept.): A. F. W. Schimper, 'The origin and growth of Amidon.'—R. Gérard, 'On the passage from the root to the stem' (5 tab.)

Botanical Gazette.—A. H. Curtis, '*Chapmannia* and *Garberia*.'—E. J. Hill, 'Botanical Notes' (chiefly on Potamogetons).—A. F. Foerste, '*Nasturtium lacustre*.'

Botanische Zeitung.—A. DeBary, 'Contributions to the knowledge of *Peronosporeæ*' (concluded).

Bulletin of Torrey Botanical Club.—E. L. Greene, 'New Plants, chiefly New Mexican' (*Astragalus Gilensis*, *A. Mogollonicus*, *Potentilla subviscosa*, *Megarrhiza Gilensis*, *Senecio Cardamine*, *S. Howellii*, *Polygonum Parryi*).—G. E. Davenport, 'Vernation in *Botrychia*.'—W. H. Leggett, 'Fertilization of *Rhexia virginica*.'

Flora.—J. B. Jack, 'On the European Species of *Radula*' (concluded) (*R. Carringtonii*, n. sp., from Killarney, Ireland).—A. Geheeb & E. Hampe, 'Additamenta ad Enumerationum Muscorum in Rio de Janeiro et Sao Paulo detectorium' (continued).—M. Westermaier & H. Ambronn, 'On the relation between the life-history and structure of Climbing Plants.'—P. G. Strobl, 'Flora of the Nebrodes' (continued).

Journal of Limean Society (Botany, vol. xix., no, 114).—S. G, Shattock, 'On the Reproductive Processes which occur in Vegetable Tissues.'—B. D. Jackson, 'Note on *Hibiscus palustris*, L., and allied species.'—Title-page and Index to vol. xviii.

Magyar Növénytani Lapok.—L. Haynald, '*Ceratophyllum pentacanthum*,' n. sp.

Midland Naturalist.—J. E. Bagnall, 'Flora of Warwickshire' (continued).

Naturalist (Huddersfield).—W. West, 'Cryptogamic Report of Yorkshire Naturalists' Union for 1880' (concluded).

(*Esterr. Bot. Zeitschrift.*— W. Voss, 'Reliquiæ Plemelianæ.'—H. Wawra, New Plants from Brazil (*Weinmannia Itatiaiæ*, *Gaultheria Itatiaiæ*, *Manettia filicaulis*, *Cystanthera citrina*) and India (*Ruellia Saltpoorensis* and *Rhitryglossa?* [*Rhytiglossa*] *indica.*'—V. von Borbàs, Peloria in *Delphinium consolida.*'—F. Antoine, 'On the development of adventitious roots in Japanese Conifers' (1 tab.)—P. Sintenis, 'Flora of Cyprus' (continued).—P. G. Strobl, 'Flora of Etna' (continued).

Botanical News.

The annual Fungus Foray of the Woolhope Club took place during the first week of October. It was attended by the following mycologists;—Messrs. Bull, Cooke, Phillips, Plowright, Howse, Duport, Bucknall, Vize, Bicknell, Walker, and Wharton. Unfortunately the Fungi, which had been so abundant this year during September, had come to an end; and the weather being remarkably dry, very few of the later species had made their appearance. The first excursion, on Tuesday, October 4th, was arranged for Moccas Park; among the few Fungi found there may be mentioned *Agaricus ditopus*, *Storea*, *adiposus*, *dryinus*, *Hygrophorus calyptræformis* and *russo-coriaceus*. The next day was devoted to Haywood Forest, Dr. Bull's favourite hunting-ground; it yielded the following species:—*Agaricus glutinosus*, *rancidus*, *ermineus*, *Cortinarius armillosus*, *caninus*, *flexipes*, *impennis* and *anomalus*, *Russula lepida*, *Lactarius pyrogalus* and *flexuosus* (the last new to this country), *Sistotrema confluens*, and *Boletus castaneus*. On Thursday, Stoke Edith Park, near the Woolhope Valley, was visited, and the following Fungi were gathered:—*Agaricus gloiocephalus*, *clypeolarius*, *rancidus*, *Cortinarius hinnuleus*, *fulgens*, and *Peziza saniosa*. Friday was devoted to the woods of Sunny Gutter, near Ludlow. Among the Fungi gathered the following may be mentioned:—*Agaricus depluens*, *Lactarius chryssorheus*, *Cortinarius armillatus*, *sublanatus*, *armeniacus*, *hemitrichus*, *sanguineus*, *Cantharellus crispus*, and *Cordiceps militaris*. The following papers were read after the usual dinner or at the evening meetings:—'The progress of Mycology,' by Dr. Bull; 'Fungus Mimics,' by M. C. Cooke; 'The Fungi of the Dolomites,' by T. Howse; 'The Fungi which attack Wheat,' by the Rev. J. E. Vize; 'The Germination of the Uredines,' by C. B. Plowright; 'Monstrosities in Fungi,' by W. Phillips; 'The Tomato Diseases,' by C. B. Plowright.

Mr. James Craig Niven, for many years Curator of the Hull Botanic Gardens, died on October 16th, aged 53. He was at one time Assistant-Curator of Kew Gardens, and published a 'Catalogue of the Herbaceous Plants' in cultivation there. In 1853 he went to the Hull Gardens, where he devoted his attention chiefly to hardy plants, of which his knowledge was very extensive.

1

1a

1b

1c

2

2a

2b

2c

1. Chara baltica, *Bruz. var.* affinis, *Groves.*
2. C. contraria, *Kuetz.*

Original Articles.

NOTES ON BRITISH *CHARACEÆ*.

By Henry and James Groves.

(Plate 224.)

The present paper was commenced as an account of *Chara baltica* and *C. contraria*, but it has been thought a convenient opportunity to publish additional localities, &c., for the other species, of which we have seen specimens since writing our "Review of the British Characeæ." We also take this opportunity to thank those botanists who have kindly sent us specimens of these plants.

Chara fragilis, Desv.—Near Dolgelly, Merioneth, 1881, *J. G.* (approaching var. *barbata*); near Thirsk, N.-E. Yorks, 1880, *G. Nicholson;* Loch Laggan, W. Perth, 1881, *R. Kidston* (approaching var. *delicatula*).

Var. *Hedwigii*.—Near Kingston, Surrey, 1880, *G. Nicholson* (see Bot. Exch. Club Report, 1880, p. 39, and Journ. Bot., 1881, p. 348); near Knowle, Warwickshire, 1870, *J. E. Bagnall;* near Ripon, M.-W. Yorks, 1881, *G. Nicholson*.

Var. *capillacea*.—Sutton Park, Warwickshire, 1878, *J. E. Bagnall*.

C. connivens, Braun.—We have received a specimen of this collected by Mr. Bolton King, at Slapton Sands, last year, which removes the doubt expressed in our "Review" as to the identity of the plant from that locality.

C. aspera, Willd.—Burwell Fen, Cambridgeshire, 1881, *H. G.;* probably the same station from which Mr. Bennett recorded it in Journ. Bot., 1881, p. 278; Lough Derg, E. Galway, 1881, *Bolton King*.

Var. *curta*, Braun, Char. Europ., p. 6. *C. curta*, Kuetz. Tab. Phyc., vii., t. 53.—Branchlets very short, somewhat incurved; spine-cells many, short. Usually much incrusted. Lough Derg, E. Galway, 1881, *Bolton King* (see Journ. Bot., 1881, p. 345).

C. baltica, Bruzel. Obs. Char. (1824), pp. 11 and 19; Fries in Aspegren's Blekings Flor. (1823), p. 65 (name); Agardh, Syst. Alg., p. 127; Wallm. Act. Stockh., 1852 (1854), p. 313; Kuetz. Tab. Phyc., vii., t. 63, f. 2; Wahlst. Skand. Char., p. 16; Monog. Sver. och Norg. Char., p. 34; Nordst. Bot. Notiser, 1863, p. 49; Braun, Consp. Char. Europ., p. 6; Bab. Man. ed. viii., p. 472.

C. hispida, var. *baltica*, Hartm. Skand. Flor. (1820), p. 376.

C. firma, Ag. Syst. Alg. (1824), Introduction, p. 28.

C. Nolteana, Braun, Ann. Sc. Nat. (1834), p. 354.
C. Liljebladii, Wallm. Act. Stockh., 1852 (1854), p. 314.
Exsicc.—Braun, Rabenh. & Stizenb., Nos. 44, 96, 114; Nordst. & Wahlst., Nos. 35–40 and 103–105; Fries, Herb. Norm., ix, 100.

Var. *affinis*, nobis.

Stem 6–18 inches high, often nearly simple, rather stout, with two rows of cortical cells to each branchlet; primary cortical cells equalling, or exceeding the secondary; upper part of stem with slender, spreading spine-cells, lower nodes thickened. Whorls of 9–10 nearly straight, or slightly incurved branchlets. Stipulodes long and slender. Branchlets of 7–9 joints, 3–4 ecorticate. Bract-cells 6–8, acute, whorled, the inner twice as long, the outer as long as the nucule. Nucule oval, 11-striate; coronula spreading; nucleus black. Globule small. Monœcious. Tab. 224, fig. 1.

Occurs in the stream running into Kynance Cove, and in the pools adjacent, where it was discovered by Mr. James Cunnack in 1876. Our attention was first drawn to the plant by Mr. Curnow, who collected it in 1878, but sections of the stem of his dried specimens failed to show that the primary cortical cells were the larger; hence we were obliged then to refer it to *C. hispida*, in spite of its evident resemblance to *C. baltica*, in general appearance. Last year, while writing our "Review," we received from Mr. Arthur Bennett fresh specimens of the plant, as cultivated by Mr. Curnow, which showed the primary cells to be slightly the more prominent. We have since examined and cultivated the plants from the stream and the various pools, and think that, although differing considerably from each other, they must all be referred to *C. baltica*. The Cornish variety differs from the type in its less rigid habit, the primary cortical cells very little exceeding the secondary, and the spine-cells being more slender, and often two or three together. One form has nearly all the joints of the branchlets uncoated, in this respect resembling the var. *Nolteana*.

C. baltica occurs principally in the Baltic district, but reaches to the coast of Norway. We are much indebted to Herr Otto Nordstedt and Dr. L. J. Wahlstedt for a large series of this, among other Scandinavian species, and to the former for kindly forwarding us copies of the description and extract from Hartmann and Aspegren, which works we have been unable to find.

C. CONTRARIA, Kuetz. Phyc. Germ. (1845), p. 258; Sp. Alg., p. 523; Tab. Phyc., vii, t. 61; Braun, Schweiz. Char. (1847), p. 15; Consp. Char. Europ., p. 6; Monatsb. Berl. Akad. (1867), p. 833; Cohn's Krypt. Flor. von Schlesien (1877), p. 405; Wallm. Act. Stockh., 1852 (1854), p. 304; Wahlst. Skand. Char., p. 15; Monog. ofv. Sver. och Norg. Char., p. 31; Nordst. Bot. Notiser (1863), p. 46; Leonh. Œsterr. Arml. Gewachse, p. 82.

C. fœtida, var. *moniliformis*, Braun, Ann. Sc. Nat., 1834, p. 355.
C. fœtida, var. β. *contraria*, Coss. & Germ. Fl. Par., ed. ii, p. 890.

Exsicc.—Braun, R. & S., 37–8, 84, 88–90; Nordst. & Wahlst., 67–77; Rabenh. Alg. Sachs., 150, 499.

Stem slender, moderately branched, with two rows of cortical cells to each branchlet, primary cortical cells more prominent than the secondary, bearing few short and obtuse, or papillate spine-cells. Whorls usually distant, of 6–8 incurved branchlets. Stipulodes small. Branchlets of 6–7 joints, about half corticate. Developed bract-cells 4. Nucules 14-striate; coronula short, spreading; nucleus black. Monœcious. Tab. 224, fig. 2.

Pool near Harestone, S. Devon, 1866, *T. R. Archer Briggs*; peat ditch, Romsey, S. Hants, 1881, *H. G.*; tank at Kew, Surrey, 1881, *G. Nicholson;* peat ditch, Wicken Fen, Cambs., 1881, *H. G.*; canal near Upton Magna, Salop, 1881, *J. G.*; peat pit, Restenet, Forfar, 1855, *A. Croall* (comm. *Arthur Bennett*).* Through the kindness of Prof. Babington, we are in possession of the plant, from Frensham, Surrey, recorded under this name, in the eighth edition of his 'Manual.' It proves, however, to be a form of *C. fragilis*.

C. contraria closely resembles *C. vulgaris* in general appearance, and in being much incrusted, but is usually smaller, more rigid, and the branchlets of the upper whorls are almost always incurved; the main distinguishing character, however, consists in the primary cortical cells being more prominent than the secondary. Like *C. vulgaris* and *C. fragilis*, it is distributed over the greater part of the world, and is very variable. Our drawing, taken from Cambridgeshire specimens, represents a small form of the species, which often attains a height of 9–12 in., with branchlets sometimes an inch in length. The var. *hispidula*, which is widely distributed and will probably be found in Britain, has longer spreading spine-cells, but as in the var. *papillata* of *C. vulgaris*, these are deciduous.

This species is often quoted as *C. contraria* of Braun, who first so labelled specimens, but it was first described by Kuetzing in his 'Phycologia Germanica;' it should therefore be written "*C. contraria*, Kuetz."

C. HISPIDA, L.—North Somerset, *Herb. Kew;* canal near Farnborough, North Hants, *H. C. Watson;* Lough Derg, East Galway, 1881, *Bolton King*.

Var. *rudis*.—Lough Derg, East Galway, 1881, *Bolton King*.

C. VULGARIS, L.—Between Melliss and Redgrave, East Suffolk, 1880, *Arthur Bennett* (see Bot. Exch. Club Report, 1880, p. 42); Swanbister, Orkney, *H. H. Johnston*.

Var. *longibracteata*.—Kew Gardens, Surrey, 1881, *G. Nicholson;*

---

* The plant from S. Devon is that recorded in Mr. Briggs's 'Flora of Plymouth,' as doubtful "*fœtida*," on our authority. Mr. Briggs now writes us that the station has been destroyed; hence a confirmation of the county record is wanted. The Kew plant is without fruit, and of that from Forfar we have but two whorls, but have little doubt in referring both to this species. *C. contraria* will probably be found to be not uncommon in Britain, especially in peat districts.

Holgate, near York, 1881, *G. Webster*; Lough Derg, East Galway, 1881, *Bolton King*.

Var. *papillata*.—Folkestone Warren, East Kent, 1881, *H. & J. G.*; Itchington Holt. Warwickshire, 1881, *J. E. Bagnall*.

Var. *crassicaulis*.—Near Thornton-le-Street, N.-E. Yorks, 1881, *G. Nicholson*.

C. CANESCENS, Loisel.—Little Sea, Studland, Dorset, 1879, *Bolton King* (see Journ. Bot., 1881, p. 346). Last year when at Falmouth, Mr. Ralfs and I (J. G.) searched the pond, pointed out to us as Budock Pool, but could find no trace of this species. Its apparent absence from the original station renders Mr. King's discovery of it in Dorset the more welcome.

C. OBTUSA, Desv.—East Norfolk, 1880, *Arthur Bennett* (see Journ. Bot., 1880, p. 319, and 1881, p. 1).

LYCHNOTHAMNUS ALOPECUROIDES, Braun.—Mr. Charles Bailey this summer collected fine specimens of this species in the old locality at Newtown, Isle of Wight, whence it seemed to have disappeared.

TOLYPELLA GLOMERATA, Leonh.—Near Thirsk, N.-E. Yorks., 1880, *G. Nicholson* (see Journ. Bot. 1880, p. 373).

T. PROLIFERA and T. INTRICATA, Leonh.—These two species were first described in Leonhardi, Œsterr. Arml. Gewachse (1854), p. 57.

NITELLA TENUISSIMA, Kuetz. — Wicken Fen, Cambs., very sparingly; plentiful in one drain, in Burwell Fen, 1881, *H. G.*

N. TRANSLUCENS, Ag.—Loch Laggan, W. Perth, 1880, *R. Kidston*.

N. FLEXILIS, Ag.—Near Falmouth, W. Cornwall, 1880, *J. W. Smith*; near Totteridge, Middlesex, 1881, *H. G.*

N. OPACA, Ag.—Near Tideford, E. Cornwall, 1880, *T. R. Archer Briggs*; near Staines, Middlesex, 1880, *H. G.*; Sutton Park, Warwickshire, 1876, *J. E. Bagnall*; near Thirsk, N.-E. Yorks., 1880, *G. Nicholson*; Floors Pond, Roxburgh, 1874, *A. Brotherston*.

Var. *attenuata*, nobis.—Branchlets much more slender and longer than in the type, the secondary rays often ¾ in. long, and under ·01 in. in diameter. Near Hythe, S. Hants, 1878, *H. G.* This var. much resembles the more slender forms of *N. syncarpa*, but the globules and nucules appear to be entirely without the gelatinous coating of that species. Herr Nordstedt, who has seen specimens of the plant, also considers it a form of *N. opaca*.

DESCRIPTION OF TAB. 224.—Fig. 1.—*Chara baltica*, var. *affinis* (nat. size); 1 a. Portion of upper whorl, magnified; 1 b. Section of stem; 1 c. Ripe nucule. Fig. 2.—*C. contraria* (nat. size); 2 a. Portion of upper whorl, magnified; 2 b. Section of stem; 2 c. Ripe nucule.

NOTES ON NORFOLK PLANTS.

By Arthur Bennett, F.L.S.

These notes are written with special reference to the Rev. Kirby Trimmer's Flora of the County, and to Mr. H. G. Geldart's list in the 'Transactions of the Norfolk and Norwich Naturalists' Society' (1874–75).

As yet little has been done among the critical genera (*Mentha* excepted), and there is a wide field for work among them; and it is especially to be desired that the Broads should be each and all carefully examined. The discoveries of Mr. Sturrock and others during the last three years in the Scottish Lochs is an encouragement to such a task. Those plants that are additional to the county are marked with a *

I have to thank Mr. H. G. Glasspoole for his kindness in allowing me to look over several old Norfolk herbaria in his possession.

There is yet much to be done among old records and herbaria, and I publish these notes with the hope that botanists will be induced to visit a county that has an interesting and varied flora, and scenery in the Broad district almost unique. Some of the localities are given to fill up gaps in Mr. Geldart's districts.

The papers by Dr. Trimen (Journ. Bot., 1877, p. 133), and by Prof. Babington (Trans. Norfolk and Norwich Naturalists' Society, 1377–78), give much information on the flora of Cromer in the north of the county. When no authority is given, I am myself responsible for the species.

**Viola lactea*, Sm.—"North Denes, Yarmouth, Miss Bell sp."—H. C. W. Mr. Watson considered that Miss Bell's specimen was *lactea* as lately as 1877, yet he does not give it for the county in Top. Bot. I have never been able to find it, although I have specially searched for it.

V. sylvatica, Fr.—*V. Riviniana* is the only form I have seen in the connty. Doubtless *V. Reichenbachiana* would be found if carefully looked for.

Cerastium tetrandum, Curt.—North Denes, Yarmouth.

Spergularia neglecta, Syme.—Yarmouth.

Scleranthus perennis, L.—Very abundant on Santon Warren, near Thetford.

Geranium pyrenaicum, L.—Near Norwich, 1878, *Mr. Walker!*

Ulex Gallii, Planch.—Felbrigg, near Cromer, *C. Bailey*, in 'Exchange Club Report' for 1874. Near Norwich, *Mr. Walker!* The Rev. Kirby Trimmer and Mr. Geldart record "*U. nanus*" only, but Prof. Babington doubted whether restricted *nanus* had been found in the county. Mr. Glasspoole has shown me specimens that I should have supposed were *nanus*, but Prof. Babington doubted them. Mr. Watson records it for E. Norfolk, on the authority of a specimen from Cooper.

Medicago sylvestris, Fries.—Cromer, *Mr. C. Bailey!* Between Norwich and Hellesdon.

I should like to record here my firm belief that *Medicago falcata*,

L., is a native plant in Suffolk; it grows on heaths, wild enough to satisfy the most inveterate doubter, and on writing the nature of its habitats to Mr. Watson, he replied, "I think it most likely, from what you tell me, the *Medicago* is a native plant in Suffolk, a county I have never visited."

M. minima, Lan.—"Thetford," *E. Forster*, in Herb. Mus. Brit. Santon Warren, near Thetford. This species is by no means so common in Norfolk as it is in Suffolk.

Trifolium suffocatum, L.—North Denes, Yarmouth. Will soon be extinct, from building operations going on.

Orobus tuberosus, L.—I feel sure I saw this between Holkham and Brancaster, but did not gather any specimens, not then knowing it was doubtful for the county. The non-occurrence, or great rarity, of this species in some of the eastern counties is somewhat remarkable.

Ononis arvensis, Auct., var. (*O. maritima*, Dum.?)—The plant of the coast sand-hills will, I think, prove to be the *O. maritima*, Dumortier, but I have seen no type specimens of his plant. There is a var. *maritima* in the new edition of Babington's 'Manual,' but whether Prof. Babington considers this the same as the Belgian plant, I do not know. When young it is non-spinous, the spines being acquired about the third year of its growth.

**Agrimonia odorata*, Mill.—"Commoner than the other species about Ormesby, *Mr. H. G. Glasspoole*." Near Caistor.

**Rosa micrantha*, Sm., *fide* Baker.—Between Ormsby and Filby.

**R. tomentosa*, Sm., var. *subglobosa*, Sm.—Between Swainsthorpe and Swardeston.

**R. canina*, L., var. *arvatica*, Puget.—Near Filby.

**R. canina*, L., var. *surculosa*, Woods.—Tivetshall, very fine.

[*Callitriche autumnalis*, Linn.—This should be expunged; the true plant is little likely to have occurred. The sub-species *truncata* would be more likely.]

C. hamulata, Kütz.—Near Yarmouth.

**Epilobium palustre*, L.; *E. ligulatum*, Baker (*fide* Haussknecht).—Filby, plentiful.

**E. obscurum*, Schreb.—Filby.

**Œnanthe fluviatilis*, Coleman.—Heigham Sounds, Hickling.

Galium verum, L., var.—The plant of the coast sand-hills agrees well with French specimens I possess of the var. *littorale* (*G. Brebissonii*, Le Jol.?)

G. tricorne, With.—†North Denes, Yarmouth. A rare plant in the county.

Senecio palustris, DC.—"Methwold Fen, 1838," *W. Marshall*. Herb., H. C. Watson! Still in fair quantity some eight miles from Yarmouth; very fine this year (1881).

Inula Pulicaria, L.—I have seen a specimen from Ormsby.

*†*Crepis setosa*, Hall, fil.—Godwick, *Mr. H. G. Glasspoole*!

Hieracium umbellatum, Linn.—Hollows on Caistor Marrams.

Gentiana Pneumonanthe, L.—St. Faiths, 1878!

Veronica verna, L.—Santon Warren, near Thetford; abundant.

Myosotis palustris, With.—Buckenham, near Norwich, very fine,

1881. Mr. H. C. Watson considered this should be verified in many counties.

**Statice binervosa*, G. E. Smith.—Cley, *Prof. Babington*, *Mr. H. C. Watson*. Brancaster, *Herb. Glasspoole!* Holkham; Holme-by-the-Sea. It is curious that both Rev. K. Trimmer and Mr. Geldart omit this plant.

Chenopodium botryoides, Smith,—"W.," in Mr. Geldart's list, is an error; the plant of Hunstanton is *pseudo-botryoides* of Watson.

Rumex obtusifolius, Auct.—*R. Friesii* is the only form I have gathered.

Polygonum aviculare, L., var.—A remarkable plant, looking very much like *maritimum*, was gathered by Mr. H. G. Glasspoole at Brundall.

Potamogeton plantagineus, Du Croz.—Ormsby, *Mr. Glasspoole!* Broome Fen!

P. perfoliatus, L.—"Thetford, *Mr. Salmon*."

P. obtusifolius, Mert. & Koch.—Mr. Geldart gives this for all his districts, but Mr. Watson doubted it; it is certainly rare in the county, and I know it from two localities only; Caistor, near Yarmouth; and "Haddiscoe Dam," *Rev. K. Trimmer* in Herb. Brit. Mus.!

P. mucronatus, Schrad.—Much more abundant than *obtusifolius*. Perhaps Mr. Geldart included this under *obtusifolius*, as he does not notice *mucronatus*, although many localities are given by Rev. K. Trimmer under the name of *P. compressus*.

P. flabellatus, Bab.—In the river at Buckenham.

***Orchis incarnata*, L.—Near Filby.**

**Epipactis ovalis*, Bab.—"In a fir plantation, Docking, from a correspondent: Miss Bell sp."—Mr. H. G. Watson. Mr. Watson, in answer to enquiries about this plant, remarks: "Of course so long back (forty years) it was sent and received as *latifolia*. The only other name the plant had in England about this date was the misnomer of *E. rubra*, given to it in Yorkshire, and intending what is now known as *Cephalanthera rubra*," Nov. 9th, 1880. This is a remarkable instance of distribution. In his Flora the Rev. K. Trimmer, under *Epipactis latifolia*, gives the station of—"In a fir plantation near Hyde Park, Docking." Can this refer to the same plant?

[*Polygonatum officinale*, All.—Should be expunged. "Never found in Norfolk," Eng. Flora. No doubt the record "near Yarmouth, *F. B.*, quoted by Trimmer, refers to Suffolk, and to the supposed station, "Lily Pits, Bradwell," but the species there was *P. multiflora*—see Turner & Dillwyn, Bot. Guide, p. 548, &c.]

***Alisma ranunculoides*, L., var. *repens*, Davies.—Filby Broad.** Under exceptional low level of the water, this occurred this year, exactly corresponding with my Irish and Welsh specimens.

Juncus Gerardi, Lois.—The sea-shore stations placed under *compressus* should likely be referred here. I have only seen *J. Gerardi*.

[*Scirpus triqueter*, L.—Almost certainly an error—see Turner & Dillwyn's 'Botanist's Guide,' p. 421.]

Carex arenaria, L.—Santon Warren, near Thetford; an inland station.

C. præcox, Jacq.—East of Thetford.

**C. ericetorum*, Poll.—Santon Warren, very sparingly.

Digitaria humifusa, Pers.—I possess a specimen labelled, "Near Bungay, but on the Norfolk side," *Mr. Stock*.

**Festuca ambigua*, Le Gall.—Santon Warren, abundant.

Botrychium Lunaria, Sw.—Santon Warren, sparingly.

Nitella opaca, Ag.—E. Norfolk!

**N. tenuissima*, Kütz.—Roydon Fen, Sept., 1852, *Herb. Borrer!*

N. translucens, Ag.—E. Norfolk!

N. glomerata, Chevall.—W. Norfolk!

**Chara stelligera*, Bauer.—Filby! Potter Heigham.

C. fœtida, A. Br.—E. Norfolk!

**C. hispida*, L.—Potter Heigham.

**C. fragilis*, Desv.—Potter Heigham.

OBSERVATIONS UPON *BRASSICA BRIGGSII*, Wats.

By E. G. Varenne.

In the summer of 1880, during a visit to the West of England, Mr. Curnow, at Newlyn, near Penzance, pointed out to me in a field a weed which in that district of the county of Cornwall he said was known by the name of Charlock or Garlic. He also observed that it was a great pest all over the cultivated land of the neighbourhood, and had been known as such during the memory of man.

The plant thus indicated by Mr. Curnow had neither the botanical characters nor the habit of growth of *Sinapis arvensis*, L., the Charlock which is so well known as an abundant weed in the corn-fields of the East of England. It agreed, however, pretty well with *Sinapis arvensis*, L., by being very abundant in the localities in which it grows, in being difficult of extirpation, and also in being an old-established weed.

On further examination and investigation, this Newlyn plant turned out to be an annual *Brassica*, with a slender tap root, agreeing in its botanical characteristics with that which has been named *Brassica Briggsii* by the late Mr. Watson. It certainly bears a great resemblance—as Mr. Watson also thought—to the *Brassica campestris*, L., as it is delineated in Plate 2234 of 'English Botany.' But the flowers of *Brassica Briggsii* are true turnip-flowers, of a much brighter yellow colour than are those of *B. campestris* in the 'English Botany' plate.

Some of the seeds of *Brassica Briggsii* brought to Kelvedon from Newlyn last year were sown in a garden-pot in the early part of the spring-time of the present year. They soon vegetated. In the very young growth of the plants the first leaves which appeared after the cotyledonous leaves had fully formed were green in colour, and beset with a number of bulbous caducous hairs.

About midsummer-time the plants were fairly in foliage,

showing the upper glaucous leaves and the bright yellow flowers, and having plenty of seed-pods formed. Unfortunately an amateur gardener picked up the interesting things for weeds, so that the opportunity of obtaining a fresh supply of seeds was lost. However, enough had been seen to warrant the conclusion that *Brassica Briggsii* was not a biennial plant.

Some very young specimens of these seedling Brassicas were dried, with the two cotyledonous and two primary leaves on them. One specimen was forwarded to my late lamented friend Mr. Watson in the middle of May, and another specimen to Mr. Briggs, of Plymouth.

Mr. Watson, as the readers of this Journal well know, first pointed out the fact that turnip-Brassicas are easily distinguishable from rape- and cole-seed, when very young, by the colour of the primary leaves; and therefore I was desirous to learn his opinion of the young *Brassica Briggsii* sent to him. The remarks Mr. Watson made concerning the young leaves, in a letter received from him, were to the effect that "the *Brassica* is *Brassica Briggsii*, I suppose; its bright green colour quite well separates it from *Napus* and *Rutabaga*."

Mr. Briggs considers the young leaves which he received from me to be similar to those grown from the seed of the *B. Briggsii* which he met with at Torpoint, Cornwall, in 1873.

On visiting Penzance again towards the end of the past July, it was plain enough that the first crop of *Brassica Briggsii* had been destroyed when the summer produce of the fields was lifted and carted away; but very soon afterwards, in the month of August, amongst very young turnips about dung-heaps and by the side of corn-fields, *Brassica Briggsii* sprung up very quickly, and it showed itself luxuriantly at the end of the month. Growing freely amongst the summer-sown turnips, it was a trouble to the boys when weeding, from the resemblance it bore to the young cultivated turnip; for they were puzzled to know which was the weed to pull up and which were the cultivated plants to be allowed to remain.

Brassica Briggsii does not in any way appear to be a new inhabitant of, or a fresh introduction during late years to, Penzance. Uniil it came under the observation of Mr. Briggs, at Yeo, Devon, in 1870, it had not attracted the notice of botanists in the West of England, and it appears to have been overlooked in that quarter of the kingdom in much the same way as were *Epilobium lanceolatum*, S. & M., and *Arum italicum*, Mill., not so very many years ago.

With regard to the distribution of *Brassica Briggsii* generally throughout Great Britain, it will be useless to refer to any except the most recent records, if we wish to have correct ideas on that point. The descriptive works of Babington and Hooker afford no information concerning *Brassica Briggsii*. And as to Smith's *Brassica campestris*, L., referred to the *Napus sylvestris* of Ray, and to the *Wilde Naveu* of Gerard, and stated by the latter writer (p. 181) to grow "upon ditch-bankes, neere unto villages and good townes, as also upon fresh marshie bankes in most places":—this, whatever it may

be, cannot well be supposed to be our plant. So that to refer to the habitats recorded in local Floras, lists, and guide-books, in the hope of obtaining thereby any idea of the distribution of *Brassica Briggsii*, would be altogether a mistake.

Mr. Briggs, in the 'Flora of Plymouth,' p. 20, says that *Brassica Briggsii* is common about that town, both on the Devonshire and Cornish side of the Tamar. He has also noticed it growing near Bodmin, in Cornwall. So far as my opportunities of observing the plant allow me to state its distribution, it is as follows:—*Brassica Briggsii* was met with near the Land's End; all round about the country to the north of Penzance; and far away eastward on the road to Truro: its line of range of growth extending from Yeo, Devon, to the extreme west of Cornwall, a distance of over ninety miles.

ON THE NATURAL HISTORY OF MADAGASCAR.

By J. G. Baker, F.R.S.

(Concluded from p. 338.)

Close affinity of the Madagascar Flora with those of Mauritius and the other small neighbouring Islands.—Between the flora of Madagascar and those of Mauritius, the Seychelles, Bourbon, and the Comoro group of islands, there is a close alliance. This may be best illustrated by examining the range of a few genera which are confined to the Mascarene group, but not entirely restricted to Madagascar alone. For instance, of the Rubiaceous genus *Danais*, a shrubby climber allied to *Cinchona*, there are four or five endemic species in Madagascar, one confined to Mauritius, and one to Rodriguez. *Aphloia*, with two or perhaps three species, grows in Madagascar, Mauritius, Bourbon, Rodriguez, and the Seychelles. Its neighbour *Ludia* grows in all the same islands, and, in addition, has lately been detected by Sir John Kirk on the mainland opposite Zanzibar. *Fatidia*, a curious anomalous genus of *Myrtaceæ*, is found in Madagascar, Mauritius, and Rodriguez. *Obetia*, a large stinging tree-nettle, figured by Gaudichaud in the beautiful atlas of plates illustrating the botany of the voyage of the 'Bonite,' is found in Mauritius, Bourbon, Rodriguez, and Madagascar. Weddell makes two species, but the Madagascar and Bourbon plant appear to me identical. *Radamæa*, a genus of *Scrophulariaceæ*, named by Mr. Bentham after King Radama, has one species in Madagascar, and a second in Galega Island and the Seychelles. *Phyllarthron*, a very curious erect Bignoniad with articulated leaves, has four species in Madagascar and one in the Comoro group. Its neighbour *Colea*, named after Sir Lowry Cole, has six species in Madagascar, one in Mauritius, and one in the Seychelles. *Stephanodaphne* of Baillon, allied to *Dais* and *Lasiosiphon* of the Cape, has one species in Madagascar and one in the Comoro group. *Cynorchis* has four or five species in Madagascar, one in Mauritius, one in Bourbon, one in the Seychelles, and one that was gathered by the

Livingstone expedition in the Zambesi country. Of striking species common to Madagascar and the smaller islands, and not found elsewhere, we have instances in *Clematis mauritiana*, *Tristemma virusanum*, *Phyllanthus casticum*, *Antidesma madagascariense*, *Acalypha colorata*, *Elatostema fagifolium*, *Oberonia brevifolia*, *Eulophia scripta*, and many other Orchids, *Smilax anceps*, *Cyperus ferrugineus* and *longifolius*. According to Dr. Kuhn's recent enumeration in the botany of Van der Decken's travels, out of 262 Madagascar ferns, 115 occur in Mauritius and 138 in Bourbon.

Close affinity of the Madagascar Flora with that of Tropical Africa.—There is a strong affinity between the forest-flora of the tropical zone in Madagascar and that of the main African continent. In *Rubiaceæ* alone there are ten genera (*Pentas*, *Otomeria*, *Dirichletia*, *Tricalysia*, *Diplocrater*, *Cremaspora*, *Alberta*, *Lecontea*, and *Anthospermum*), otherwise restricted to Tropical Africa, which extend their range to Madagascar. Of the fine genus *Dombeya*, in *Sterculiaceæ*, there are about 25 species, half of which are natives of the forests of Madagascar, and the others of Kaffraria, Natal, Abyssinia, Bourbon, and Mauritius. There is a remarkable genus of *Podostemaceæ* called *Hydrostachys*, one species of which is used as a charm in Madagascar at the bull-fights, the idea being that if a man hold a piece of the plant in his hand it will ensure the victory of his own animal. Of this genus there are six species in Madagascar, one in Natal, one in Mozambique, and one in the Zambesi country. Of the Hypericaceous genus *Psorospermum*, one species of which enters largely into the Madagascar pharmacopœia as a remedy in scabies and eczema, there are half a dozen species in the island, and on the continent four, in the Mozambique district, Nile-land, and Upper and Lower Guinea. Another very curious genus is *Xerophyta*, an endogen allied to *Narcissus*, with shrubby stems and star-like blue flowers, with a glutinous inferior ovary. Of this there are four species in Madagascar, ten or a dozen in Angola, Abyssinia, Natal, and Central Africa, and about half a dozen in the mountain provinces of Central Brazil. We have further instances of characteristically tropical African genera which extend to Madagascar in *Thylacium*, *Acridocarpus*, *Cadia*, *Myrothamnus*, *Trochomeria*, *Raphidocystis*, *Ophiocaulon*, *Landolphia*, *Anthocleista*, *Kigelia*, *Brillantaisia*, *Mimulopsis*, *Pycnocoma*, *Uapaca*, and many others, and of well-marked species common to Madagascar and Tropical Africa in *Haronga madagascariensis*, which occurs also in Mauritius, Mozambique, Angola, and Senegambia, *Desmodium mauritianum* and *paleaceum*, *Eriosema cajanoides* and *parviflorum*, the Copal Tree (*Trachylobium Hornemannianum*), *Albizzia fastigiata*, *Rubus apetalus* and *pinnatus*, *Serpicula repens*, *Nesæa erecta* and *linearis*, and *Dracæna reflexa*.

Slight special affinity of the Flora of Madagascar with that of Tropical Asia and the Malay Isles.—There are a few curious cases of special affinity between the floras of Madagascar and the Seychelles with those of Tropical Asia and the Malay archipelago. There are about 30 known species of *Nepenthes*; of these 28 belong to India and the Malay archipelago. There is one endemic species

in the Seychelles and one in Madagascar, but the order does not reach Mauritius, Bourbon, or the African continent. Of *Tambourissa*, in *Monimiaceæ*, there are about a dozen species divided between Madagascar and Mauritius, and one in Java. Of the scandent Asclepiadeous genus *Stephanotis*, one species of which, with its clusters of tubular pure white waxy flowers, is a great ornament of our conservatories, there are five species in Madagascar, and five in the Malay archipelago and South China. Of *Strongylodon*, in *Phaseoleæ*, there are four species: one in Polynesia, one in the New Hebrides, a third in Ceylon, and a fourth in Madagascar. Of the *Lagerstromia*, in *Lythraceæ*, there are 18 species in Tropical Asia, concentrated in Birma, and one has lately been discovered in the hill-country of Central Madagascar. *Hernandia peltata* extends from Polynesia to Madagascar and the Comoro group, but fails to reach the African continent. Other Asiatic species found in Madagascar, but not in Continental Africa, are *Afzelia scarabæoides*, *Pongamia glabra*, *Afzelia bijuga*, and *Barringtonia speciosa*. But when the flora of the whole tropical zone is so homogeneous in its general character, it does not seem to me either safe or necessary to assume a comparatively recent land-connection of Madagascar with India and Malaya to account for a few cases of this kind.

Affinity of the Flora of the hill-country of Central Madagascar with those of the Cape and mountains of Central Africa. —There are many curious cases of affinity between the flora of the hill-country of Central Madagascar and those of the Cape and the mountains of Central Africa. Many of the groups and genera characteristic of the Cape flora are represented in Central Madagascar, as they are in the mountains of Abyssinia, Angola, Guinea and the Zambesi country by species closely allied to, but not absolutely identical with, those of their head-quarters. At the Cape there are upwards of 500 heaths. In Central Madagascar there are about a dozen species—one *Ericinella* and the rest Philippias. The *Selagineæ* are represented by a single endemic species, *Selago muralis* of Bentham, which grows upon the walks of the royal palace in Antananarivo. The aloes are represented in Madagascar by *A. Sahundra* and *A. leptocaulon*; the Cape *Iridaceæ* by species of *Aristea*, *Geissorhiza* and *Gladiolus*; the *Proteaceæ* by *Faurea* and *Dilobeia*; the special Cape ferns by *Mohria caffrorum*, *Cheilanthes hirta*, *Pellæa calomelanos* and *P. hastata*; the Cape saprophytic *Scrophulariaceæ* by *Alectra melampyroides* and *Harveya obtusifolia*; the Cape orchids by species of *Disa* and *Satyrium*: and the Cape *Thymelaceæ* by species of *Dais* and *Lasiosiphon*. Other characteristically Cape genera, represented by one or two endemic species in Central Madagascar, are *Phylica*, *Anthospermum*, *Diclis*, *Chironia*, *Halleria* and *Streptocarpus*. There are a few curious cases in which characteristically temperate species reach Central Madagascar, or a Madagascar species reappears at the Cape and amongst the Central African mountains. Amongst the vascular Cryptogamia of Central Madagascar are *Asplenium Trichomanes*, *Nephrodium Filix-mas*, *Aspidium aculeatum*, *Pteris aquilina* and *P. cretica*, *Lycopodium*

complanatum and *L. clavatum*. *Asplenium Mannii* reappears in the Cameroons and Zambesi-land. The only Madagascar violet (*V. Zongia*, Tulasne, = *V. emirnensis*, Bojer, = *V. abyssinica*, Steud.) only occurs elsewhere at 7000 feet above sea-level in the Cameroons, at 10,000 feet above sea-level at Fernando Po and amongst the mountains of Abyssinia. The only Madagascar Geranium (*G. emirnense*, Bojer, = *G. compar*, R. Br., = *G. simense*, *latistipulatum* and *frigidum*, Hochst.) has a precisely similar range of distribution. The only Madagascar *Drosera* (*D. madagascariensis*, DC., = *D. ramentacea*, Burchell) reappears at the Cape, and amongst the mountains of Angola and Guinea. *Agauria salicifolia* is common to the mountains of Madagascar, Mauritius, Bourbon and the Cameroons; and has lately been found by Mr. Thomson on the high plateaux round Lake Nyassa. *Caucalis melanantha* occurs only in Central Madagascar, at an elevation of 9000 feet in Abyssinia, of 7000–8000 feet in the Cameroons, and of 7000 feet in Fernando Po. *Sanicula europæa* occurs in Central Madagascar, the mountains of Abyssinia, the Cape, 4000 to 7000 feet in the Cameroons, 4000 feet in Fernando Po, and is widely spread through Europe and other parts of the north temperate zone. Just as in Europe, there is a close affinity between the floras of the Pyrenees, Alps, Carpathians and British mountains with those of Norway, Sweden, Lapland, and the arctic regions; so in Africa there is a close affinity between the floras of the mountains and plateaux of the central mass of the continent and the wonderfully rich flora of the Cape, and in this affinity Central Madagascar claims a distinct share.

The following propositions will, I believe, therefore, present a fair general summary of the leading characteristics of the Madagascar flora:—

1. The flora of the tropical zone throughout the world is remarkably homogeneous in its general character, and to this general rule Madagascar furnishes no marked exception. There is no well-marked plant type largely developed in the island which is not found elsewhere, and none absent that one might, *à priori*, expect.

2. About one in nine of the genera are endemic, but they are all small genera, mostly belonging to the large natural orders, and closely allied to cosmopolitan generic types.

3. There is a close affinity between the tropical flora of Madagascar and that of the smaller islands of the Mascarene group.

4. There is a close affinity between the tropical flora of Madagascar and that of the African continent.

5. There are a few curious cases in which Asiatic types which do not occur in Africa are met with in Madagascar, but these bear a very small numerical proportion to the great mass of the flora.

6. There is a distinct affinity between the flora of the hill-country of Central Madagascar and those of the Cape and the mountain-ranges of Central Africa.

ON A COLLECTION OF FERNS MADE BY MR. CURTIS IN THE MALAY ISLANDS AND MADAGASCAR.

By J. G. Baker, F.R.S.

The Kew Herbarium has lately been indebted to Messrs. Veitch for a small but interesting and well-dried collection of plants formed by Mr. Curtis whilst travelling lately on their account in Java, Sumatra, Borneo, and Madagascar. Amongst the ferns which it contains, the following are those that seem most worthy of special notice. The first numbers are those of the collector, and those within parentheses indicate the position of the novelties in the sequence followed in our 'Synopsis Filicum.'

8. *Alsophila podophylla*, Hook.—Java. Not quite the type, which is known in China only.

100. *Gleichenia vestita*, Blume.—Borneo.

24. Lecanopteris Curtisii, Baker, *n. sp.*—Rhizome not seen. Stipe above 2 in. long, naked, shining, pale brown, as is the main rachis of the frond. Frond lanceolate, simply pinnate, chartaceous in texture, quite glabrous, green above, glaucous beneath, $1\frac{1}{4}$–$1\frac{1}{2}$ ft. long, 2–$2\frac{1}{4}$ in. broad. Pinnæ about 30 pairs below the end one, which is similar to the others, ligulate, obtuse, 1–$1\frac{1}{2}$ in. long, $\frac{1}{4}$–$\frac{1}{3}$ in. broad, adnate to the rachis by a broadly dilated base, crenate, all fertile, except two or three of the lowest pairs, which are rather reduced in size. Main veins distinct from the midrib to the edge, about $\frac{1}{8}$ in. apart, with fine veinlets anastomosing in irregular areolæ. Sori 7–8 on each edge of the pinnæ at the tip of the main veins, included in an oblong, boat-shaped, 1-valved marginal involucre, similar in texture to the rest of the frond.—Sumatra. I incline now to regard *Lecanopteris*, which in 'Synopsis Filicum' was massed in *Polypodium*, as a distinct genus allied to *Dicksonia* and *Deparia*. This makes a fourth species, the three others being *L. carnosa*, Blume; *L. pumila*, Blume; and *L. deparioides*, Baker. (*Dicksonia deparioides*, Cesati Fil. Born., 13 t. 4 fig. 8).

21. *Davallia Blumeana*, Hook.—Sumatra.

16. *Davallia hirta*, Kaulf.—Mount Salak, Java.—A very large form, with fully tripinnate fronds, 6 ft. in length, and lower pinnæ 2 ft. long.

79. *Lindsaya borneensis*, Hook.—Borneo. Gathered previously by Lobb and Burbidge.

128. *Pteris triplicata*, Agardh.—Madagascar.

127 (13*). Pteris (*Eupteris*) appendiculata, Baker, *n. sp.*—Stipe slender, naked, stramineous, as is the rachis. Frond oblong-deltoid, tripinnatifid, membranous in texture, bright green on both surfaces, glabrous, 15–18 in. long, 8–9 in. broad. Pinnæ deltoid, parallel with the rachis on the upper side at the base, cuneate-truncate on the lower, with a long terminal segment and 1–2 pairs of shorter side segments, appendiculate with a large oblong auricle on each side at the base; end pinnules 4–5 in. long, $\frac{1}{3}$ in. broad, sharply serrated in the sterile portion. Veins fine, sub-

distant, simple or forked. Involucre narrow, glabrous.—Madagascar. Like *P. triplicata* in general habit and texture, but incutting like *madagascarica* and *mutilata*.

126 (1*). Pteris (*Eupteris*) phanerophlebia, Baker, *n. sp.*—Stipes tufted, slender, castaneous, 2-12 in. long, with only a few minute scales low down. Fronds sagittate, usually entire, 3–6 in. long, with a deltoid terminal lobe and two deflexed deltoid auricles, with a rounded sinus between them, rarely triphyllous, with unequal-sided lateral pinnæ, membranous in texture, glabrous, the sterile portion serrated. Veins flabellate from a distinct midrib, very fine and close, but not anastomosing, very distinctly visible. Involucre brown, glabrous, rigid in texture.—Madagascar. A very interesting novelty, allied only to the well-known Brazilian *P. sagittifolia*, Raddi, from which it differs by its much thinner texture, very distinct free veins, and fronds sometimes triphyllous.

46. *Pteris reducta*, Baker.—Sumatra. The second finding of this, which was discovered not long ago in Sumatra by Dr. Beccari. Mr. Curtis has also obtained Dr. Beccari's other new Sumatran Pteris, *P. Radula*.

44 (6*). Pteris (*Eupteris*) sumatrana, Baker, *n. sp.*—Stipes naked, castaneous, as is the rachis, about ½ ft. long. Fronds deltoid, 8–9 in. long, simply pinnate, subcoriaceous in texture, quite glabrous, green on both surfaces. Pinnæ 5–6-jugate below the simple linear end one, the upper lateral ones decurrent down the rachis on the lower side to the next pair, all simply linear, 3–4 in. long, ⅓–½ in. broad, except the lowest pair, which have two large secondary segments on the lower side, the tips strongly inciso-crenate. Veins obscure, immersed, fine, simple or forked. Fruit not seen.—Sumatra. Allied to *P. Hookeriana* and *serrulata*.

80. *Asplenium subaquatile*, Cesati.—On trees near the head waters of the Ladak River, Dutch Borneo. Another discovery of Signor Beccari's confirmed.

29. *A. hirtum*, Kaulf.—Sumatra. A curious small rigid variety, with oblanceolate fronds under 1½ in. broad at the middle.

27. *A. normale*, D. Don.—Padang, Sumatra. Adds this common Indian species to the ferns of the Malay Islands.

43. *Nephrodium?* sp.—Allied in cutting to *abortivum* and *arbuscula*, with the pinnæ of the lowest 4–5 in. of the stipe suddenly dwarfed down to small auricles. The ordinary pinnæ are sessile, 2–2½ in. long, above ½ in. broad, with a distinct gland at the base, and cut down about half-way to the rachis into oblong contiguous entire secondary segments. Veins very distinct, simple, arcuate, 7–8-jugate, the lowest two of each group uniting at their tips without fruit.—Sumatra.

98 (175*). Polypodium (*Eupolypodium*) Curtisii, Baker, *n. sp.*—Rhizome wide-creeping, about the thickness of a quill, its dense paleæ large, lanceolate, membranous, dull brown. Stipes brown, naked, 2–3 in. long. Fronds oblanceolate, 8–9 in. long, 3–3½ in. broad at the middle, glabrous, subcoriaceous, green on both surfaces, cut down nearly or quite to the rachis into close entire

linear pinnæ 1–1½ in. long, ⅙ in. broad above the dilated deltoid base, the lowest 3–4 inches of the frond reducing down to a mere repand wing to the rachis. Veins quite hidden. Sori round, medial, superficial, 6–9 on each side of the midrib in the fully-developed central pinnæ.—Padang, Sumatra. Allied to *P. apiculatum* in its pinnæ, but remarkable for the sudden dwindling of the lower ones. In texture like *P. inæquale* and *P. Grammitidis*.

25. *Polypodium tenuisectum*, Blume.—Sumatra. I now look upon *P. sertularioides*, Baker, discovered in Samoa by the Rev. S. Whitmee, as conspecific.

26. *P. millefolium*, Blume.—Sumatra. Of this I have never seen a specimen, but Mr. Curtis's specimen precisely agrees with Blume's figure of the Javan plant.

14. *P. nutans*, Blume.—Java. On the mountains near Buitenzorg, on mossy trees up to an elevation of 10,000 feet.

33. *Antrophyum subfalcatum*, Brack.—Sumatra.

124. *Vittaria scolopendrina*, Thwaites. Madagascar.

121 (1*). Acrostichum (*Elaphoglossum*) schizolepis, Baker, *n. sp.*—Rhizome short-creeping, ⅙ in. diam., its dense paleæ lanceolate, membranous, bright red-brown, crisped, acuminate, and irregularly ciliate-fimbriate. Sterile fronds oblong-lanceolate, 1–3 in. long, with a petiole 1–4 in. long, obtuse, deltoid at the base, chartaceous in texture, with a few scattered minute adpressed brown scales beneath, with moderately close ascending simple or forked veins. Fertile fronds smaller, with a stipe reaching a length of 8–9 inches.—Madagascar. Allied to *A. conforme*, Sw.

31, *A. bicuspe*, Hook.—Mr. Curtis has found the typical form in Sumatra, and in Borneo the var. *integrifolium*, and what I suppose to be a variety of this species with four very long cusps.

90. *A. sorbifolium*, L.—A remarkable variety from Borneo like what was formerly called *Lindsaya? Parishii*.

81. *Selaginella latifolia*, Spring.—Borneo.

83. Selaginella alopecuroides, Baker, *n. sp.*—Stems ascending, continuous, leafy to the base, with several ascending simple or 2–3-furcate arcuate ascending branches. Larger leaves crowded, oblique lanceolate, 3½–4 lines long, produced on the upper side into a large cordate auricle, which is imbricated over the stem, so as to quite hide it, bright green, not ciliated. Smaller leaves ovate, ascending, much imbricated, acute, but not cuspidate, ⅛ in. long. Spikes square, ½–1 in. long, ⅙ in. diam., 2–3-nate from the tip of the branchlets; bracts uniform, rigid, erecto-patent, rigid, strongly keeled, ⅛–⅙ in. long.—Borneo. Allied to *S. Cumingiana* and *S. atroviridis*, Spring. The finest of the Old World Ascendentes, rivalling in the breadth of its leafy branches the New World *S. articulata*.

NOTES ON THE FLORA OF EAST SUSSEX.

By F. C. S. Roper, F.L.S.

In 1875, Mr. W. B. Hemsley issued with the 'Journal of Botany' an "Outline of the Flora of Sussex," giving a very full list of all the plants then known in the county, or recorded by Mr. Borrer, Mr. Coleman, Dr. Bromfield, and others. Since then many interesting additions have been made to the Botany of East Sussex, especially in the Cuckmere district around Eastbourne; in the East Rother district, farther east, by the Rev. E. N. Blomfield, of Guestling; and in the Ouse district, on the west, by Mr. J. H. A. Jenner; and as no complete flora of the county has yet appeared, the following supplement to Mr. Hemsley's list may be of interest.

We have now about 860 species of flowering plants and ferns recorded from the Cuckmere district. Of all these I have specimens in my herbarium; whereas when I published my first "Introduction to the Flora" in 1875 we had only 704. I still believe, however, that there are about fifteen or twenty plants, which it is probable may be found, but they are rare, and only likely to be met with on the northern or eastern extremities of the district. Should I succeed in finding the bulk of these I propose to publish a second edition of the 'Flora,' which will then give a fairly complete report on the vegetation of the district, and show the distribution of many rare plants, of which more peculiar and interesting species occur in this part of Sussex (especially in a geographical point of view) than in any other division of the county. The following plants are new to the county or to East Sussex:—

1. *Ranunculus Flammula*, L., var. *pseudo-reptans*, Thuill.—Swampy ground, High Wood, Bexhill. Ditch near Cross-in-hand, on the road to Waldron.

2. *Sisymbrium Sophia*, L.—Holywell Quarry, Eastbourne. Near the Grand Stand, on Brighton Racecourse, *Hon. J. L. Warren.*

3. *Arabis hirsuta*, Br., var. *glabrata*, Syme.—On the Downs above the Links, Eastbourne; a very rare and interesting little plant, only reported in Sir J. D. Hooker's 'Students' Flora' from Great Arran Island, on the west coast of Ireland, and from the same locality, collected by Mr. Andrews, by Dr. Syme (now Boswell), in Eng. Bot. (ed. 3), ii. 168. Specimens were sent to Mr. Watson and Dr. Trimen, who concurred in the determination.

4. *Lepidium ruderale*, L.—Side of Meads Roads, Eastbourne, not included as a Sussex plant by Mr. Hemsley or Mr. Watson; but reported as a ballast casual, in West Sussex, by the Hon. J. L. Warren, Bot. Ex. Club Rep., 1874.

5. *Viola permixta*, Jord.—Roadside on the edge of the Downs, between Wannock and Jevington; and on the slope of the Downs, above Wannock; near Eastbourne. It has also been found near Lewes by Mr. J. H. A. Jenner.

6. *V. hirta*, L., var. *calcarea*, Bab.—Downs near Beachy Head, and downs above Willingdon. Confirmed by Prof. Babington.

7. *Silene noctiflora*, L.—I have specimens from Mrs. B. M. Oakeshott, from the shore on the Bexhill side of St. Leonards; and from Rev. E. Ellman, from the Downs between Alciston and Bishopstone. Mr. Hemsley only mentions "Seedlescombe, near Poynings, West Sussex, 1814, *Herb. Bor.*, not reported since"; and it is not included as an East Sussex plant in Mr. Watson's Top. Bot.

8. *Rosa sepium*, Thuill.—Found in considerable abundance near Glynde, on the road to Lewes, by Mr. J. H. A. Jenner (see Journ. Bot., 1879, p. 376).

9. *R. canina*, L., var. *sphærica*, Gren.—Hedges near Lewes, Mr. J. H. A. Jenner.

10. *R. arvensis*, Linn., var. *bibracteata*, Bast.—Near Battle, Mr. J. H. A. Jenner. Netherfield Wood, north of Ashburnham, and Gnat Wood, near Hailsham. These roses have been confirmed by Mr. J. G. Baker.

11. *Saxifraga granulata*, L.—Roadside near Hurstmonceux Castle; new to the county.

12. *Carduus nutanti-crispus*, Sond.—Slope of the downs, above the cemetery, Eastbourne.

13, *Filago apiculata*, G. E. Sm.—Chalky field above Eastbourne Cemetery.

14. *Senecio viscosus*, L.—Rather abundant on the shingly road, between Rye and Rye Harbour, first noticed by the Rev. E. N. Blomfield. Omitted by Mr. Hemsley as a Sussex plant, but included by Mr. Watson in Top. Bot., with signs of doubt, having, as he informed me, only been once found, by Mr. A. Carr in 1858, on a railway-bank near Frant Station, probably brought there with ballast, large quantities of which are taken inland from Rye for road-making.

15. *Erythræa capitata*, Willd., var. *sphærocephala*, Towns.—On the downs near Beachy Head, and downs above Alciston (see Journ. Bot., 1881, p. 303).

16. *Hippophaë rhamnoides*, L.—A large patch on Camber Sands, opposite Rye Harbour; new to the county. Shown me by the Rev. E. N. Blomfield.

17. *Typha latifolia*, L., var. *media*, DC.—Rare, in a swamp at Hurstmonceux.

18. *Zostera marina*, L., var. *angustifolia*, Fries.—Abundant in a large pond on the Shingle Beach, near Eastbourne.

19. *Carex flava*, L., var. *lepidocarpa*, Tausch.—Rather rare. Backington Wood, Heathfield, Rev. A. K. Cherrill. Park Wood, Hellingly. Not recorded from the county by Mr. Watson.

20. *Phleum pratense*, L., var. *nodosum*, L.—Rare. Side of the road from Langley Farm to Walls End, Pevensey, on the edge of the Shingle Beach.

21. *Festuca pratensis*, Huds., var. *b. loliacea*, Huds.—Roadside at Mill Gap, Eastbourne. By path from Bexhill Church to Bulverhythe Level.

22. *Festuca sylvatica*, Vill.—Rare. Fairlight Cliff, Rev. E. N. Blomfield.

The following plants are not recorded from the Cuckmere district, East Sussex, by Mr. Hemsley :—

1. *Myosurus minimus*, L.—Plentiful this year in a field between the Cuckmere Bridge, Berwick, and Abbot's Wood.

2. *Camelina sativa*, L.—Sandy ground near Horeham Station.

3. *Viola palustris*, L.—Swampy field east of Kemp's Wood, Little Markly, and in a marshy meadow between Markly and Warbleton. First shown me by Mr. G. Haviland.

4. *Sagina ciliata*, Fr.—Top of a wall at Littlington.

5. *Geranium lucidum*, L.—Side of the path from Bexhill Church to Bulverhythe Level. Only reported for the county as a weed in the vicarage garden at Woodmancote, by Mr. Hemsley, and by Mr. Watson, from West Sussex. The locality was shown me by the Rev. G. Langley.

6. *Rhamnus catharticus*, L.—Roadside near Sherman's Bridge, Berwick. Between Polegate and Wilmington.

7. *Anthyllis Vulneraria*, L., var. *Dillenii*, Schultz.—Not uncommon on the Downs near Beachy Head. First noticed for East Sussex by Hon. J, L. Warren, in Journ. of Bot., 1877, p. 195. By inadvertence Mr. Warren states that Boreau's character of *Dillenii* is "apiculus curved, not straight"; it should be "apiculus straight, not curved." The plants are readily recognised on the downs, by the cream-coloured flowers with red tips.

8. *Agrimonia odorata*, Miller.—Border of Scrip Wood; between Stunt's Green and Cowbeech; and by East Knole Wood, Horeham.

9. *Poterium muricatum*, Spach.—Abundant amongst Lucerne at Upperton, Eastbourne.

10. *Pyrus torminalis*, Ehrh.—Tilehurst Wood, near Hailsham, Between Wilmington and Abbott's Wood.

11. *Epilobium montanum*, L.—Common. Gnat Wood. Near Wannock. Mill Wood, Bexhill. Hurstmonceux. Netherfield Wood, north of Ashburnham.

12. *Myriophyllum alterniflorum*, DC.—Marsh ditch between Hailsham and Magham Down.

13. *Pimpinella magna*, L.—Jevington Holt. First shown me by the Rev. E. Ellman. Only previously known as a Sussex plant, from a single specimen found by Mr. Borrer on Silver Hill, near Roberts Bridge. There is, however, no Sussex specimen in Mr. Borrer's Herb. at Kew.

14. *Galium uliginosum*, L.—Peaty ground at Hove, near Bexhill, by Mr. J. H. A. Jenner.

15. *Anthemis arvensis*, L.—Corn field. Between Eastdean and Beachy Head. Top of Down near Crapham Hill. Magham Down, north of Hailsham.

16. *Vaccinium Myrtillus*, L.—Wood near Little Markly. Shop Wood, between Cross-in-hand and Waldron. White House Wood, Waldron. Peculiar to the north-west of the district.

17. *Gentiana Pneumonanthe*, L.—Heathy ground about half a mile south of Heathfield Chapel. Field north of St. Dunstan's Wood, Heathfield. The occurrence of this fine plant is queried by Mr. Hemsley.

18. *Sibthorpia europæa*, L.—Bank of a large pond, Cross-in-hand. Abundant by the stream running through Heathfield Park, and sparingly on the banks of most of the streams running south from Heathfield. I notice this plant, which has lately been found over some miles of country, from Cross-in-hand to Dallington Forest, because Mr. Hemsley states that it is "becoming scarce;" and Mr. Watson, in Top. Bot., notes that it is "said to have become extinct in East Sussex." I have it, however, from six stations in this and the East Rother districts of the county.

19. *Mentha rotundifolia*, L.—In considerable quantity in a swampy field, immediately north of Peppering Powder Mill ponds, near Battle. First discovered by Mr. Butler, of Hastings.

20. *Ballota nigra*, L., var. *ruderalis*, Koch.—Roadside near Polegate, on the road to West Ham, near Berwick Church. Mr. Watson confirmed the specimens I sent him in 1876, but has only recorded it in Top. Bot. from Oxford and Northumberland.

21. *Symphytum officinale*, L., var. *patens*, Sibth.—Waste ground, near Berwick. Roadside, near Heathfield.

22. *Anagallis tenella*, L.—Near Gothan Farm, Bexhill. Bexhill Common. Near Heathfield Chapel.

23. *Rumex maximus*, Schreb.—Banks of the Cuckmere, near Littlington, and Alfriston. First noticed in the latter locality by Mr. J. H. A. Jenner (see Journ. Bot., 1878, p. 305).

24. *Daphne Laureola*, L.—Church Road, Hurstmonceux. Roadside between Berwick Village and the station, Rev. E. Ellman.

25. *Myrica Gale*, L.—Possingworth, near Cross-in-hand. Heathy ground near Heathfield. Hooe Common.

26. *Potamogeton rufescens*, Schrad.—Marsh ditch by the side of the road from Pevensey to Wartling.

27. *P. obtusifolius*, Mert. & Koch.—Marsh ditch between Hailsham and Magham Down. Near Berwick.

28. *P. polygonifolius*, Pourret.—Swampy place in High Wood, Bexhill.

29. *Triglochin palustre*, L.—Swamp by the Cuckmere, near Sherman's Bridge, Berwick. Bulverhythe Level; Crumbles, near Langley. Queried for the district by Mr. Hemsley.

30. *Narthecium Ossifragum*, Huds.—Swampy field east of Kemp's Wood, Little Markly, Boggy ground south of Heathfield Chapel. Near Cross-in-hand. High Wood, Bexhill.

31. *Scirpus multicaulis*, Sm.—High Wood, Bexhill.

32. *S. cæspitosus*, L.—High Wood, Bexhill.

33. *Eriophorum angustifolium*, Roth.—Boggy ground, High Wood, Bexhill. Berwick Common. Hooe Common, Mr. J. H. A. Jenner. Near Little Markly.

34. *Carex laevigata*, Sm.—Creep Wood, Ashburnham. Wartling Wood, near Hurstmonceux. High Wood, near Rushlake Green.

35. *Carex binervis*, Sm.—High Wood, Bexhill. Scrip Wood, near Cowbeach. Park Wood, near Carter's Corner.

36. *Agrostis Spica-Venti*, L.—Very rare. Sandy Ground near Horeham Station.

37. *A. setacea*, Curt.—Rare. Heathfield Park, near the Tower. Heathy ground near Heathfield Station. Only known as a Sussex plant from specimens in Mr. Borrer's Herbarium. I mention it as a recent confirmation of a very old report.

38. *Calamagrostis lanceolata*, Roth.—East Knole Wood, Horeham. Swamp in Hurstmonceux Park. Only known as a Sussex plant from the specimens in Mr. Borrer's Herbarium.

39. *Kœleria cristata*, Pers.—Abundant on the Downs at Jevington Holt. Downs above Cow Gap, near Beachy Head. Near Berwick.

40. *Glyceria plicata*, Fries.—Ratton Decoy. Michelham, Mr. B. D. Jackson.

41. *Sclerochloa loliacea*, Woods.—Near Bopeep Station, St. Leonards. Slope of the Redoubt, Eastbourne.

42. *Lolium temulentum*, L.—Field between Bexhill and Bulverhythe. Waste ground at Horeham Station.

43. *Aspidium angulare*, Willd.—Roadside near Catsfield.

44. *Nephrodium Oreopteris*, Desv.—Roadside between Waldron and Cross-in-hand. Nettleworth, near Heathfield, Rev. A. K. Cherrill.

45. *Osmunda regalis*, L.—High Wood, Bexhill. Boggy field, near Little Markly. Dallington Forest. Becoming almost eradicated by fern hunters for the London market.

46. *Botrychium Lunaria*, Sm.—Very rare. Bexhill Common, Mr. G. Soane.

47. *Lycopodium Selago*, L.—Heathfield Park, under the trees, near the Tower.

Plants new to the East Rother District, East Sussex :—

1. *Helleborus viridis*, L.—Side of a stream at Buss Green, near Wadhurst.

2. *Cakile maritima*, L.—Camber Sands, opposite Rye Harbour.

3. *Ceratophyllum submersum*, L.—Marsh ditch, east of Camber Sands, near Rye Harbour. Queried for East Sussex by Mr. Watson.

Senecio viscosus and *Hippophaë rhamnoides*, already alluded to, only occur in the East Rother division of the county.

I have in my herbarium specimens of all the plants noticed, and all have been collected by myself, except where otherwise stated.

SHORT NOTES.

KENTISH CRYPTOGAMS.—In the list of mosses of Kent, published in this Journal for 1879, *Pottia crinita* does not occur. Last month (November) I found a specimen with fruit on the cliffs below Shorncliffe. In the pools on the shore near by *Cordylecladia* (*Gracilaria*) *erecta* and *Phyllotylus nicæensis*, Kutz., and in the East Wear Bay, Folkestone, *Sphacelaria plumosa*, Harv., occur. This is, I believe, the most easterly point in this country at which these rare Algæ have been hitherto met with. The *Cordylecladia* had already young pod-like fruit on it, but the others were sterile. The *Sphacelaria plumosa* is the plant which occurs also at Joppa and at Caernarvon, and bears sporangia on the pinnules, and not on special branchlets on the rachis like the plant found on the Ayrshire coast, which, as I have elsewhere stated, properly belongs to the genus *Cladostephus*.—E. M. HOLMES.

DERBYSHIRE PLANTS.—The following corrections should be made in the list published in this Journal during the present year—*Potamogeton filiformis* (p. 296). I have submitted the plant recorded under this name to Mr. Arthur Bennett, who writes:—"It is a form or variety of *pectinatus* I know well. I have it from Hungary, Bohemia, &c., all named as *P. marinus* (*filiformis*, Nolte). The fruit is much larger than true *filiformis*; the style being nearly (or quite) central is the cause of its being called *marinus*, accompanied as the latter is with fine leaves of a peculiar texture and somewhat greasy appearance. If true *filiformis* be ever found in England, I should expect it from the Shropshire Meres or the Lake Country (Westmoreland, Cumberland, &c.). Specimens similar to your plant have been issued on the Continent as *marinus* (from Prague, in Bohemia, Buda-Pesth in Hungary)."—*Carex ornithopoda*, Willd. This was first found in Miller's Dale by Mr. H. Newton and Mr. J. Whitehead (see Journ. Bot., 1875, p. 193). Mr. Rogers (who is still alive) first found it in Cressbrook Dale in June, 1875.—I find that "Disley," mentioned a few times, is in Cheshire; so also is Marple, although the plants recorded thence were collected in Derbyshire.—W. H. PAINTER.

ASPLENIUM GERMANICUM, Weiss.—In the 'Report of the Exchange Club' for 1880 (p. 39), I see this plant recorded as sent from the Pass of Llanberis by Canon Butler. But he states that it is not the same as the Swiss and German plant. He refers it, on the authority of the Kew botanists, to *A. Breynii*. Now that is a synonym of *A. germanicum*, and I have specimens of it before me (some named *A. Breynii* and some *A. germanicum*) from several well-known continental botanists. I possess specimens named *A. germanicum* and "*A. Breynii?*" from Mr. Butler, or from the late Hugh Lewis, to whom it was given by him, and they are, I quite

believe, exceedingly fine specimens of *A. septentrionale*. This latter fern was tolerably abundant in one part of the Llanberis Pass before the ravages of tourists begun; I fear that cannot be said of it now, as the place has long been known to the guides. When I pointed out to Hugh Lewis that apparently the specimen given to him by Mr. Butler was *A. septentrionale*, he told me that he believed he had found three roots of the true plant very high up on the Glyder side of the Pass. I may say in passing that he was not a guide, and was well known and recommended to me by the late rector of Llanberis, Mr. Williams. He took me, at Mr. Williams's desire (who considered the spot inaccessible to him), to the place where he could show me one of the roots. It is a spot wbich I have not visited since that occasion in 1865, owing to its difficulty of access. He offered to show me the other two roots, but I declined. That which I saw was a good strong root, with many fronds and many broken stems of old ones. I took two fronds, leaving the root untouched. I very much doubt if any botanist has since seen it, as Hugh Lewis died shortly after 1865, and he alone knew the spot. The fronds were less than two inches long, and exactly resemble those of the continental plant, and of the British ones from Wastdale, Borrowdale, and Dunkeld now before me, and are very like the figure given by Newman ('Ferns,' ed. 3, p. 258). As this plant is exceedingly scarce, I have ventured to make these remarks, although I have not seen the specimens distributed by the Exchange Club.—C. C. Babington.

Epipogum aphyllum.—Our readers will learn with interest that this Orchid has again been found in England. We learn from Prof. Babington that "It has been gathered two or three times by some ladies at Ludlow, in a strictly preserved wood, at about a mile and a half to the north of that town, in Herefordshire. I have not seen a specimen, but have no doubt about it."

Notices of Books and Memoirs.

The Movements of Plants. By Charles Darwin, LL.D., F.R.S., assisted by Francis Darwin. London: John Murray.

A late notice of such a book as this is justified by the names of the authors: no writings bearing the name of Darwin admit of rapid or superficial reading. In 'The Movements of Plants' we are led to reflect upon past knowledge of certain well-known slight motions on the part of the higher phanerogams, besides being introduced to new and startling facts in the revelations of movements hitherto undescribed; but the crowning of the whole is the ingenious application of the facts to support the well-known views of Darwin. Having demonstrated that certain peculiar variations or periods occur in the growth of small tracts of cells, and that

these result in slight movements of the tissues built up by the cells, we have the foundation for series of phenomena produced by modifications of the original movement, by the action of physical and other agents of different kinds, and if the movements thus rendered are advantageous they may be amplified by natural selection. The chief object of the present work is to describe and connect together several large classes of movement common to almost all plants.

After a short introduction, partly occupied with clear definitions of useful terms, the authors at once plunge into a series of detailed observations, proving that the radicles, hypocotyls, and epicotyls of the young seedlings of numerous plants are normally engaged in circumnutation; the clever way in which each part is made to write an approximate history of its own movements, either with a bristle, &c., on smoked glass plates, or with a ray of light on the retina of the observer, will repay careful attention by any student. Not only in the patient observations themselves, but in the clear descriptions and frank statements of partial failures, do we learn how to experiment and record.

A large and varied number of seedlings of phanerogams, one Fern, and one Selaginella are proved to be in constant circumnutation; and we may probably safely accept the conclusion that the same is true for all plants, some more and some less. In Chap. ii. we are led to imagine the way in which the motion proceeds, and to see that some benefit may accrue to the infant plant, as its radicle seeks to screw and wriggle its tip into the soil; the insumation becoming completed by the force of growth in length and breadth. The authors even attempt to measure this force, and succeed in conveying the idea that a penetrating radicle exerts considerable pressure on the surrounding particles of soil. On the other hand, the writhing of the upper portions of the seedling (commonly arched to give more purchase, and to withdraw the cotyledons with as little abrasion as possible) lifts up the load of soil above, and wriggles through to light and air. We cannot dwell on the several other advantageous acquirements of seedlings, but pass on to consider the important discoveries enunciated in Chap. iii. When the tip of a radicle meets a solid obstacle, it does not obstinately press upon it and try to force itself through to its own destruction, but, as the authors observed, "the delicate root-cap, when it first touched any directly opposing surface, was a little flattened transversely; the flattening soon became oblique, and in a few hours quite disappeared, the apex now pointing at right angles to its former course. The radicle then seemed to glide in its new direction over the surface which had opposed it, pressing on it with very little force." The authors did not think this due to mere mechanical resistance, for the pressure was too slight; and it is known that the growing tip of a radicle is more rigid than the parts just above, which have ceased to grow. Besides, a very yielding object—*e. g.*, thin tin-foil—will deflect the rigid tip of the radicle. The effects could not be due to a mere slowing of growth at the point of contact, since the curvature

produced was not confined to that part, but extended 8–10 mm. above: thus was arrived at the idea that the extreme tip of a radicle is *sensitive* to touch, and may *transmit* an influence to the upper parts, causing them to bend away from the touching object, carrying the tip away at the same time. It was shown by Sachs some years ago that the radicle is sensitive to contact at a region some mm. above the apex; but in this case the radicle turns *towards* the touching object, and curves round it as a tendril does round a stick.

Then follow experiments of an exhaustive nature, carefully recorded and with those frank admissions of difficulty which render the whole work so instructive and charming. Minute objects, carefully attached to the side of the extreme apex, cause the radicle to bend away from the touching body, against the action of gravitation, and even in opposition to innate forces as well.

This work is well done, and we venture to think that it opens up a splendid field for discovery; indeed, the authors would probably be the readiest to admit that it commences rather than concludes an investigation. Their own researches on the influence of temperature are surprising, so far as they go; instead of the tip being more sensitive at higher temperatures, the reverse is the case. They failed to decide whether simply cold or hereditary effects of season, &c., affected other trials. Changes in growth, density, slight electrical disturbances, &c., will have to be understood, we venture to think, before this part of the subject is exhausted. The nature of the "sensitiveness" itself offers a deep problem to the molecular physicist, and we seem to be brought face to face with a property of protoplasm in its simplest form. The object of the writers, however, is to establish the facts of the movements resulting from the stimuli, and the firm basis of experimental evidence established enables us to proceed with confidence. We must even accept that the tip of the radicle can "distinguish between harder or more resisting and softer substances," since it becomes deflected from a piece of sand-paper, even if a piece of thinner paper be at the same time affixed to the opposite side. The tip of the radicle is drawn *towards* moist air, and the authors adduce experiments to prove that the sensitiveness here also resides in the apex; hence, what with circumnutation (primarily a phenomenon of growth), geotropic, and innate tendencies to plunge straight down, sensitiveness to the touch of a harder body driving the tip to one side, and a sensitiveness to moisture attracting it in an opposite direction, there is a complex and beautiful problem before one who attempts to picture the insinuation of a radicle into the soil.

We are not quite convinced of the accuracy of the conclusions as to the causes which render secondary rootlets and branches capable of replacing primary ones, when the latter are destroyed or injured; in normal cases it would be very difficult to strike the balance between even the external forces which direct a branch or rootlet into that portion of the available space which is least

traversed by other air- and light-, or water- and food-seeking organs of like nature.

The circumnutating movements of stems, leaves, &c., in mature plants are described in Chap. iv., and convince us still further of the generality of these phenomena; one of the most instructive of the illustrations—that of the strawberry runner—brings clearly before the reader the mode by which a creeping stem wriggles its way amongst dense herbage, and at the same time aids him in imagining the microscopic writhings of the rootlets beneath.

Some of the *periodic* movements of leaves have been known for many years, and in some cases for centuries; but the authors bring vividly before us the fact that so many leaves describe more or less elongated elliptical figures, that we must believe that all leaves circumnutate—not always regularly, but more or less decidedly. In a large number of examples the swing of the leaf is increased periodically with the waning light of evening, or as the sun rises in the morning; the leaf moves its apex towards the zenith in the evening, and falls towards the horizon next morning. But some leaves describe figures approaching the circle, and all stages of transition are found.

Some climbing plants are typical of the one extreme, their stems swinging in nearly circular sweeps; certain leaves are so far modified towards the other extreme, that, except for certain irregular loops and zigzags, we might not trace the connection between their vertical sweeps in one plane and the elongated ellipses which these courses really consist of. The reason that the circumnutation of climbing stems has become so regular and circular is, that the sweeping internodes may swing over a larger area and stand a better chance of meeting with a support. But what reason can we assign for the long drawn up and down movements of leaves? The authors answer, because there is some benefit derived by the leaf from a vertical position at night, as opposed to a more or less horizontal position during the day. If they can demonstrate this, we have to admit that such modifications of circumnutation might be increased by natural selection.

And thus we are introduced anew to that beautiful phenomenon, alike admired by poet and philosopher—the "Sleep of Plants." Since the days of Linnæus, the nyctitropic movements of plants have been a wonder of the vegetable world; we are now brought suddenly to meet an explanation of them in terms of utility, and it is pleasing to find that they lose nothing when examined in the fierce glare of modern thought—the exploded wonder simply reveals deeper and yet more charming marvels.

Careful experiments and observations have convinced the Messrs. Darwin that if a sleeping leaf is prevented from assuming its normal position on a clear, chilly night, by being fastened so that the upper surface is exposed to direct radiation, a certain amount of injury follows, varying in different cases—in some experiments proving fatal. The upper surface suffers more than the lower; and the upper surface is usually carefully protected. This is not explained; may we suggest that possibly the fact of the

lower looser parenchyma having much air entangled between the cells has to do with the diminished liability of the lower side to suffer from chilling?

Various and complicated movements are undergone by the sleeping leaves or leaflets; many simply stand vertically, others twist on their axes through several, even 90°. Many leaflets twist and fold over one another; or a terminal leaflet revolves, and then falls vertically between two others, the three forming a compact flat bundle exposed with the edges up and down. Writing, as we do, from the tropics, we have abundant examples of the most complex of these phenomena. Certain plants which are especially cultivated on hot hill-sides sometimes suffer severely from chilling by radiation when grown on flats; their leaves do not sleep, in the sense here referred to, and the rapid radiation from the flats may cause the most serious damage to leaves; while trees on the slopes do not so suffer, though at a higher elevation. We must believe that such a plant would be better able to grow on exposed flats if the leaves stood vertically at night.

Cotyledons sleep; not always in the same way as the leaves of the same plant; and many plants with sleeping cotyledons do not place their older leaves in nyctitropic positions; while others have sleeping leaves, but their cotyledons do not sleep. We can verify the statement that the cotyledons of *Mimosa pudica* are placed vertically upwards, and face to face at night, though the first leaf drops its rachis like a semaphore, and folds its leaflets forwards in an imbricate manner, as do older ones.

Besides sleeping movements, the authors enter into the description and discussion of two other forms of modified circumnutation; those caused by the *direction* of incident light,—nyctitropic movements being determined by changes in the *intensity* of surrounding light,—and those due to the action of gravitation. Chapters viii. and ix. are occupied with the important subject of heliotropic movements. If it is of advantage to a seedling to turn its little green assimilating organs to the light as soon and as conveniently as possible, we may see how the attracting stimulus of bright light tends to amplify those parts of the normal circumnutating movement which drives the stem or leaf in its direction; some organs still try to return on their course, but in others the superior advantages gained by obeying the new impulse have, so to speak, eliminated this tendency to rebel, and circumnutation has become modified into a straight-forward movement towards the source of light.

All degrees of obedience to the new impulse seem to be exhibited, and marvellous examples are given of the power of discrimination possessed by certain plants between the slightly more and slightly less powerful source of light. We must reluctantly pass over the delicate and interesting experiments tending to show that this sensitiveness to light resides in the tips of the organs; many difficulties suggest themselves, and some parts of the very complex problems to be dealt with cannot be considered solved. The student will gain a deep insight,

however, into the conflict which a young seedling enters upon when first it raises its green organs to the light. Gravitation excites positive or negative movements, as does light, on various parts of plants; and in Chaps. x. and xi. of the 'Movements of Plants' we are placed in possession of the results of many observations. Geotropic movements cannot be controlled to the extent possible with others, but the authors have ingeniously overcome many difficulties. Here again the influence of gravitation is considered to be especially effectual in modifying the direction and amount of a movement already present; if the modification acts for the benefit of the organ, it will be preserved, and even increased. We should run the risk of doing injustice if we attempted to review shortly this complex part of the work; it is no easy task to see one's way through the various and varying influences which are at any time determining the position of a young stem or root, and the authors of the present book are to be congratulated on the clearness of their exposition of so difficult a subject. But again they go further, and localise the sensitiveness to gravitation in the tip of the radicle; undoubtedly the illustration given, of a horizontally-extended radicle which did not curve geotropically within 1 to 1½ hours, but did curve some time afterwards,—although the tip had been cut off at the end of the 1½ hours,—seems inexplicable on any other obvious supposition than that the influence of gravitation had acted long enough while the tip was on, to cause the necessary changes for curvature at a later period.

But we must conclude this imperfect survey of an immense work. We should like to learn more of the exact effects of cutting or cauterising so delicate an organ as the tip of a radicle, of which the thin walled cells contain dense and actively dividing protoplasm; we should also welcome more knowledge on the exact influence of the heat rays, and possibly others in the more delicate experiments on localised sensitiveness to light. But the authors are not concerned with these problems; not only is this work a valuable addition to the ever-growing library of "Darwinism," but it is in itself a store of well-observed and well-recorded facts of independent utility. It will aid the student to avoid that too-common error of regarding the cell and the plant as mechanism very crudely worked by simple physical agents, and yet will effectually warn the careful reader against imagining that because the phenomena are complex they are necessarily beyond the range of scientific investigation. Modern vegetable physiology is daily learning to appreciate more and more, in the complicated phenomena of heredity and so-called innate impulses, that the action of physical agents during past ages must be taken into account; and although we avoid the worn-out terminology of a vicious dualism, the life of an organism depends on deeply-involved actions and reactions not to be revealed entirely by our present means. We do not know what causes the alternate rushes of fluid and solid particles in certain tracts of cells, nor do we know how physical agents really act on the particles. Sensitiveness to stimuli is placed amongst the remarkable "properties

of protoplasm," and we can dimly picture how complex must be the changes called forth by a successful stimulus; but here our knowledge stops, and heartily welcome must be any earnest endeavours to apply the simpler result of physical science to the complex problems of Biology. W.

Characeæ Novæ-Zeelandiæ. By Otto Nordstedt.—The sixteenth volume of the Proceedings of the University of Lund contains under the above title, an account of the Charas collected by Dr. Berggren in New Zealand. The name of the author is a sufficient guarantee that the paper is a valuable contribution to the literature of the group. Eight species are enumerated, of which two are described as new (*Nitella leptosoma* and *N. conformis*), and full descriptions are given of *N. pseudo-flabellata*, Braun, MSS., and of *Chara Benthami*, the characters of which were previously only denoted by the clavis in 'Die Characeen Afrika's.' The name of *C. Benthami* is improper, inasmuch as Mr. Bentham has had nothing to do with the plant in question, nor with the genus.—H. & J. G.

We are indebted to the courtesy of Sir J. D. Hooker for an "advance copy" of the 'Kew Gardens' Report' for 1880, which, although dated "January 1, 1881," has not yet been published. As usual, the Report contains a great deal of interesting matter; the portion relating to the herbarium we shall reprint as soon as our space will allow; while the extracts from the reports of the various colonial botanic gardens contain much information which will be useful to the student of economic Botany. No less than six names of plants have the abbreviation "sp. n." appended to them, although in no case is a diagnosis given. This seems to us a very reprehensible practice; of course such names have no claim to recognition or adoption by future workers, and we purposely abstain from quoting them, as we deprecate any action which might help to give them publicity. As might be expected, discrepancies occasionally arise owing to the want of correspondence between the date printed at the head of the Report with that at which it is actually issued; thus Mr. B. D. Jackson's 'Guide to the Literature of Botany,' which appeared in April of the present year, is spoken of in the Report, dated January 1 of the same year, as already published.

New Books.— Ch. Royer, 'Flore de la Côte-d'Or, avec déterminations par les parties souterraines,' tom. 1 (Paris, F. Savy). —G. Dragenhoff, 'Die qualitative und quantitative Analyse von Pflanzen und Pflanzentheilen' (Gottingen, Vandenhoeck & Ruprecht).—E. Bretschneider, 'Early European Researches into the Flora of China' (London, Trübner). — W. Woolls, 'Lectures on the Vegetable Kingdom, with special reference to the Flora of Australia' (Sydney, Fuller). — C. Groenlund, 'Islands Flora' (Copenhagen).—H. Baillon, 'Anatomie et Physiologie Végétales' (Paris, Hachette).

ARTICLES IN JOURNALS.—OCTOBER AND NOVEMBER.

Botanical Gazette.—(Oct.) G. Vasey, '*Calamagrostis Howellii*, sp. n.'—C. H. Peck, 'New Species of Fungi.'—(Nov.) D. C. Eaton, '*Saussurea americana*, n. sp.'—W. Trelease, 'The foliar nectar-glands of *Populus*.'—G. Vasey, '*Alopecurus saccatus*, n. sp.'—T. Morong, '*Potamogeton Hillii*, n. sp.'

Botaniska Notiser (Nov.)—N. H. Nilsson, '*Naias flexilis* in Sweden' (var. β. *microcarpa*, nov. var.)—E. Ljungström, '*Epipactis microphylla*.'

Botanische Zeitung.—(Oct.) C. von Nägeli, 'Growth of Starch-granules by intussusception.'—K. Goebel, 'On the development of Sporangia' (1 tab.)—(Nov.) R. Haensler, 'On the Diatoms of the London Clay.'—F. Johow, 'On the cell-nucleus of *Chara fœtida*' (1 tab.)

Bulletin of Torrey Bot. Club (Oct.)—G. E. Davenport, '*Onoclea sensibilis*, var. *obtusilobata*.'—D. C. Eaton, '*Woodsia mexicana*, Fée.'—(Nov.) E. L. Greene, 'New plants, chiefly New Mexican' (*Talinum confertifolium*, *Saxifraga fragarioides*, *Ribes Mogollenicum*, *Primula Rusbyi*, *Phacelia cærulea*, *Urtica gracilenta*, *Zygadenus porrifolius*).—J. B. Ellis, 'New Ascomycetous Fungi' from Utah).

Flora (Oct.)—A. Geheeb & E. Hampe, 'Additamenta ad enumerationem Muscorum in Rio de Janeiro et Sao Paulo detectorum' (concluded).—P. G. Strobl, 'Flora of the Nebrodes' (continued).—W. Nylander, 'Addenda nova ad Lichenographiam europæam' (many new species, including *Verrucaria interseptula* from Wastdale, Cumberland).—L. Celakovsky, 'On the position of *Boragineæ*' (1 tab.)

Hedwigia (Sept.)—G. Winter, 'Pezizæ Sauterianæ.'

Midland Naturalist.—J. E. Bagnall, 'Flora of Warwickshire' (continued).—(Nov.) M. C. Cooke, 'On commencing the study of Fungi.'

Naturalist (Huddersfield) (Oct.).—W. E. A. Axon, 'On an Epidemic of *Tricophyta tonsurans*.'—(Nov.), F. A. Lees & W. West, 'A local Ramble and Fungus-hunt.'

Œsterr. Bot. Zeitschrift.—(Oct.) G. Beck, 'Plantæ Novæ' (*Orobanche Krylowi*, *O. Pareysi*, *Cirsium spinifolium* (*spinosissimum* × *palustre*), *Ustilago cingens*.)—S. S. v. Müggenberg, 'New forms of *Peziza* (*Strossmayeria*, gen. nov.)—G. Egeling, 'On the Nourishment of Lichens.'—P. Sintenis, 'Cyprus and its Flora' (contd.)—P. G. Strobl, 'Flora of Etna' (contd.)—(Nov.) G. von Niesel, 'Three new Pyrenomycetes' (*Leptosphæria pachyascus*, *L. Plemeliana*, and *Sphærella intermixta*).—J. Pantocsek, 'On Bosnian and Herzegovian Plants.'—S. S. v. Müggenberg, 'Mycological Notes.'—G. Egeling, '*Tuber cibarium*.'

Scottish Naturalist (Oct.)—J. Knox, 'Life of George Don' (concluded).—A. Sturrock, 'Notes on rare aquatic Plants.'—F. B. White, 'Cryptogamic Flora of Mull.'—Id., 'Preliminary List' of Perthshire Plants (continued).—J. Stevenson, 'Mycologia Scotica' (continued).—J. Cameron, 'The Gaelic Names of Plants' (contd.)

Proceedings of Societies.

Linnean Society of London.

November 3, 1881.—Sir John Lubbock, Bart., F.R.S., in the chair.—The Rev. W. Moyle Rogers and the Rev. W. H. Jones were elected Fellows of the Society. The President, in announcing the death of the Treasurer, Mr. Frederick Currey, spoke of the esteem in which he was held, and put the following Minutes of Council to the meeting:—"That the Council and Fellows of the Linnean Society of London, having heard with the deepest regret of the death of the Treasurer, Mr. Frederick Currey, desire to place on record their sense of the great loss sustained by the Society, in his death, and their sincere appreciation of the valuable services rendered by him during twenty years as Secretary, and afterwards as Treasurer." "That a copy of the foregoing resolution be communicated to the family of the late treasurer." These resolutions, having been sympathetically spoken to by a former President (Mr. Bentham) and former Secretaries (Mr. Stainton and Mr. Mivart), were carried unanimously.—Dr. Maxwell Masters showed an unusually fine spike of *Calanthe Veitchii*, a hybrid raised in Messrs. Veitch's establishment some years ago between *Limatodes rosea* and *Calanthe vestita*.—Mr. Geo. Bentham then read his paper, "Notes on the *Gramineæ*," of which the following is an abstract:—*Gramineæ* are so widely diffused, occur in such quantities, and are so easily dried, that a very large number of bad species have been established; thus, whilst newly described species of *Orchideæ* will probably hold their own, many new Grasses must be renamed, in accordance with their real character. In a systematic point of view, the great mistake made by Linnæus and his successors was in regarding the whole spikelet as a single flower, with a calyx and corolla to be compared with those of the more perfect Monocotyledons. Robert Brown, with his usual sagacity, pointed out this error, and first set forth the lines on which the order could best be subdivided, but he had the idea that the upper and lower palea represented the three outer segments of the perianth; and his great influence is still felt in the terminology, although Hugo von Mohl has shown the mistake in his ideas. The French botanists, L. C. Richard, Desvaux, and Palisot de Beauvois, published their observations early in this century; the arrangement devised by the last was, however, far too technical to be generally adopted, and his descriptions are often so vague that the really good analytical drawings attached are quite necessary for determination. A few years later, Kunth, Trinius, and Nees von Esenbeck worked contemporaneously. Kunth's 'Revisio Graminum' is not only splendidly illustrated, but remarkable for accuracy in detail; but his first two volumes of the 'Enumeratio Plantarum,' containing the Grasses, were done hurriedly, as he himself bewailed. Kunth carried out Brown's notions of structure to an absurd extent. Trinius's 'Fundamenta

Agrostographiæ' was founded on insufficient materials, but he worked with energy and zeal, and somewhat modified Kunth's terminology. Nees von Esenbeck never confined himself exclusively to *Gramineæ* as did Trinius; he published no general conspectus of the order, but he described his species with great care, and his 'Agrostologia Brasiliensis' is probably his best work. Whilst his divisions are more natural than those of the writers last mentioned, he did not sufficiently compare his plants from different parts of the world; for instance, Brown's Australian *Panicum semialatum* is raised by him to a genus in India as *Coridochloa*, and in South Africa as *Bluffia!* The last general enumeration of grasses is that of Steudel in 1855, the 'Enumeratio Plantarum Glumacearum,' the worst production of the kind I have ever met with. He was an excellent mechanical compiler, but no botanist, and frequently described grasses as new which were correctly given in their proper place without recognition. Much has also been published in local floras, and some genera have been overlooked, and later genera have consequently become so firmly established in usage that it would be pedantry to revive the earlier names in such cases as *Blumenbachia* for *Sorghum*, *Fibrichia* for *Cynodon*, *Santia* for *Polypogon*, or *Singlingia* for *Triodia*. The more important works of recent date on grasses are those of Parlatore, in the first volume of of his 'Flora Italiana;' Cosson and Durieu's glumaceous volume of the great unfinished 'Flore d'Algérie; Doell's *Gramineæ*, in the 'Flora Brasiliensis,' and Fournier's grasses for the Mexican flora, this last being printed but not yet published. In recent times we looked to the late General Munro to unravel intricacies; his monograph of *Bambuseæ* and detached papers showed great promise, but he left nothing behind but notes in his herbarium and library. My own preparation for the work was the study of European grasses for the 'Handbook of the British Flora,' and of Old World grasses for the 'Flora Hongkongensis' and 'Flora Australiensis,' when I was in constant correspondence with Munro. Having now reviewed the American and other forms, I have somewhat modified my former views. The general arrangement in tribes is as follows:—

A. Paniceæ.

Tribus 1. *Paniceæ.*
„ 2. *Maydeæ.*
„ 3. *Oryzeæ.*
„ 4. *Tristegineæ.*
„ 5. *Zoysieæ.*
„ 6. *Andropogoneæ.*

B. Poaceæ.

Tribus 7. *Phalarideæ.*
„ 8. *Agrostideæ.*
„ 9. *Isachneæ.*
„ 10. *Aveneæ.*
„ 11. *Chlorideæ.*
„ 12. *Festuceæ.*
„ 13. *Hordeæ.*
„ 14. *Bambuseæ.*

INDEX.

Abbot's Herbarium, notes on, 40, 67
Achillea fililoba, 255
Acrostichum botryoides, 206; juglandifolium, 207; polybotryoides, 207; schizolepis, 368; siliquoides, 53; suberectum, 207
Actinoschœnus, 126
Adiantum Wattii, 190
Æcidium Rusbyi, 159; Sarcobati, 285
African (Central) plants, 178
Agardh's Species Algarum (rev.), 26
Agaricus Brownei, 93; cellaris, 93; parthenopejus, 126
Agonis Scortechiniana, 350
Alchemilla conjuncta, Distribution of, 91
Allan's American Characeæ (rev.), 92
Algæ, new British, 31
Algeria, Flora of, 29
Aloe elegans, 116
Alopecurus saccatus, 382
Alsophila hispida, 202; late-vagans, 203; podophylla, 202
American plant-names, 351
Androsace mucronifolia (*errore* puncronifolia), 90; Indian species of, 192
Anglesea, Flora of, 28, 128
Anthella (?) phyllacantha, 60
Arabis bijuga, 32, 190; pangiensis, 32, 100
Aran Island (Donegal) plants, 19
Arctic plants, 95
Aristotelia Braithwaitei, 350
Asarum caudigerum, 142
Asclepias pinifolia, 159
Ascomycetella, 221
Asplenium Breynii, 374; diminutum, 53; germanicum, 374; longicaule, 204; longisorum, 204
Astragalus Gilensis, 351; ictericus, 320; maroniensis, 320; Mogollonicus, 351
Athamanta chinensis, 325
Athrixia fontana, 190
Atti della Societa Crittogamologica Italiana, 126
Audibertia Vaseyi, 221
Australian Plants, Tate on, 125

Babington, C. C., on Potamogeton lanceolatus, 9, 54; Osmunda regalis in Cambridgeshire, 88; 'Manual of British Botany' (rev.), 280; on Asplenium germanicum, 374
Bagnall's Warwickshire Flora, 126
Baker, J. G., on Thomson's African Collections, 178; on Kalbreyer's N. Granada Ferns, 202; Synopsis of Pitcairnia, 225, 266, 303; memoir of H. C. Watson, 257; a new Dracæna from Singapore, 326; on the Natural History of Madagascar, 327, 362; on Curtis's Malay and Madagascar Ferns, 366
Ball, John, on removal of Florence Museum botanical collections, 177
Barrington on Irish plants, 189
Beckwith, W. E., on Shropshire plants, 48, 106, 143
Beeby, W. H., on Surrey, Sussex, and Hants Plants, 279
Berkshire, Scirpus maritimus in, 55; S. pauciflorus in, 251
Bentham on Orchideæ, 62; on Cyperaceæ, 94; on Gramineæ, 383
Bennett, A., on Potamogeton lanceolatus (tab. 217), 65; notes on Potamogetons, 240; Teesdale plants, 251; Irish Potamogetons, 312; Potamogeton heterophyllus, *var.* pseudonitens, 344; on Norfolk plants, 357
Bennett (A. W.), on Colours of Spring Flowers, 313
Bessey's Botany (rev.), 349
Bigelovia juncea, 159; rupestris, 159

Botanical Exchange Club Report for 1879, 175; for 1880, 314, 346
Botanical Nomenclature, 75
Botanical Record Club Reports (rev.), 25
Botrychium Lunaria in Shropshire, 217
Braithwaite's British Mosses, 29, 158
Braithwaite, R., Sphagnum subbicolor, 116
Brassica Briggsii, 360
Briggs, T. R. A., form of Carex pilulifera, 151; hybrids in Epilobium, 308; Leontodon hastilis, 312; Pyrus latifolia in E. Cornwall, 345
Bristol, Fungi, 190; Flora of, 224, 350
Britten, J., Scirpus maritimus in Berkshire, 55; Sonchus palustris in Cambridgeshire, 152; Thlaspi alpestre in Somerset, 174; memoir of R. A. Pryor, 276
British Characeæ, new (t. 224), 353
British Fungi, Cooke's Illustrations of, 93
British Lichens, new, 113
British Museum, Report of Dept. of Botany for 1880, 252
Brousse on Fruits (rev.), 317
Brussels, Report of Bot. Congress at, 350
Bryological Notes, 114
Buckinghamshire Plants, 251
Buitenzorg Garden, Annals of, 320
Bulgaria spongiosa, 285

Calamagrostis Howellii, 382
Cambridgeshire, Nitella tenuissima in, 278; Osmunda regalis in, 54, 88; Sonchus palustris in, 152
Campanula rotundifolia in Japan, 90; scabrella, 285
Carduus xanthacanthus, 255
Carex Bastardiana, 151; flava, 161; lepidocarpa, 161; saxumbra, 24 =pilulifera, *var.* Leesii, 97 (tab. 218); pilulifera, 151
Caernarvonshire, Flora of, 28
Carruthers, W., Report for 1880 of Bot. Dept. of British Museum, 252
Cephalotus, Morphology of, 129 (tt. 219 and 220)
Ceratophyllum pentagonum, 351
Chara baltica, *var.* affinis (tab. 224), 353; contraria (tab. 224), 354; obtusa (tab. 216), 1, 278; stelligera, 1, 278
Characeæ, Notes on British, 353
Characées Génevoises (rev.), 158
Chemical tests for Lichens, 115
Chile, introduced plants in, 176
Chinese Plants, new, 46, 112, 142, 150, 209, 216, 243
Chinese Puzzle by Linnæus, a, 325
Cinchona Ledgeriana a distinct species (tt. 222, 223), 321
Cineraria canadensis, 326
Cirsium spinifolium, 382
Clarke, C. B., notes on Commelinaceæ (t. 221), 193; revision of Indian species of Leea, 135, 150, 163
Cheilanthes Parishii, 285
Cleistogamy, 84
Coccocypselum geophiloides, 160
Coelonema, 30
Coffee-leaf Disease, 95, 125
Colchicum autumnale, Spring-flowering form of, 175
Colonsay, Flora of, 154
Colour of Spring Flowers, 313
Commelinaceæ, C. B. Clarke on, 193 (t. 221)
Coniferæ, Manual of, 320
Cooke's Illustrations of British Fungi, 93
Cornus crispula, 216; paucinervis, 216
Cornwall Plants, 55, 151, 217, 345
Crassula dependens, 190
Currey, F., Memoir of, 310
Curtis's 'Flora Londinensis,' dates of, 309
Cyathea dissoluta, 52; monstrabila, 275; Thomsoni, 180
Cyme, history of the Scorpioid, 3
Cyperaceæ, Bentham on, 94
Cyrtanthera citrina, 352

Danæa serrulata, 208
Darwin's 'Movements of Plants (rev.), 375
Dasya Gibbesii in Britain, 31
Datisca hirta, 326
DeCandolle's 'Monographiæ,' vol. iii., 255
Delphinium scaposum, 93
Derbyshire, Flora of, 210, 244, 293, 374
Desmidiæ of N. Wales, 127
Devonshire Roses, 30; Carex, 151
Dicentra ochroleuca, 255

Dick's (Robert) Herbarium at Thurso, 64
Dickson, A., Morphology of Cephalotus, 129 (tt. 219 and 220)
Dicksonia pubescens, 203
Didymodon styriacus, 190
Dipcadi Bakerianum, 190
Distribution of Alchemilla conjuncta, 91
Don, G., life of, 191
Donegal Plants, 19, 233
Draba Mogollonica, 93
Dracæna Cantleyi, 326
Druce, G. C., on Oxfordshire Roses, 91; Littorella lacustris in Oxfordshire, 217; Viola lactea in Bucks, 251; N. Bucks plants, 251; Scirpus pauciflorus in Berks, 251; Flora of Northamptonshire, 285
Dryophyllum, 351
Duncan's (John) Herbarium given to Aberdeen University, 64; death of, 287
Dunwich Rose, the, 56

Ectocarpus terminalis in Britain, 31
Engler's 'Botanische Jahrbucher,' 29
'English Botany,' ed. iii., authorship of, 89
Epilobium, hybrids in, 308
Epipactis latifolia, English forms of, 71
Epipogum aphyllum in England, 375
Epping Field Club, Transactions of, 158
Ericinella passerinoides, 32, 190
Ernst's Lectures, 285
Erythræa capitata, 87, 302
Eryngium campestre in Suffolk, 55
Eumitria, 286

Ferns of Jamaica, 51, 275; of New Granada, 202
Festuca oraria, 242
Fissidens, Morphology of leaf of, 28; rufulus, 158
Fitzgerald's 'Australian Orchids,' 92
'Flora Londinensis,' dates of issue of, 309
Florence Museum, proposed removal of collections from, 177
'Folkestone, Rambles round,' 29
Fungus Foray of Woolhope Club, 352

'Garden, The,' 59
Gaulthera Itatiaiæ, 352
Gazania cæspitosa, 190
Génévier's Herbarium, 192
Gethyllis longistyla, 191
Geysirs, Kuntze on, 27
Gilia scopulorum, 286
Gladiolus Thomsoni, 179
Gnaphalium dioicum in Cornwall, 217
Gramineæ, Bentham on, 383
Gray, Asa, a Chinese Puzzle by Linnæus, 325
Grieve on Flora of Lower Hebrides, 154
Griffith's Flora of Carnarvonshire, 28
Groves, H. & J., on Chara obtusa (tab. 216), 1, 278; notes on British Characeæ (t. 224), 353
Groves, J., Report of Bot. Exchange Club for 1880, 314, 346
Gymnogramme vellea, 206; xerophila, 206

Hampe's Moss Herbarium, 192
Hanbury, F. J., Tulipa sylvestris in flower, 175
Hance, H. F., a new Hong-Kong Melastomacea, 46; Campanula rotundifolia in Japan, 90; a new Hong-Kong Anonacea, 112; a new Asarum, 142; a new Senecio, 150; new Chinese plants, 209; new Corni, 216; a new Chinese Rhododendron, 243; a new Araliacea, 274; on Taccaceæ, 289
Hants plants, 279
Harknessia, 159
Hart, H. C., Plants of North Aran Island, Donegal, 19; on Irish Plants, 167; on Donegal plants, 233; on Wexford plants, 338
Hauckia, 60
Heat, development of in Phytelephas, 154
Heath's 'My Garden Wild,' 319; 'Where to find Ferns,' 349
Hebrides, Flora of Lower, 154
Hedeoma Itatiaiæ, 160
Hemileia vastatrix, 95, 125
Hemsley's Central American Botany, 188; list of Garden Orchids, 254
Henderson's 'Handbook,' 319
Herpolirion capensis, 32, 190
Hertfordshire Oaks, 152

Herts Nat. Hist. Soc., Transactions of, 158
Hibberd's 'Familiar Garden Flowers' (rev.), 58
Hieracium asperulum, 255; carneum, 159; Kalmii, 326; latibracteatum, 190; rubrum, 190
Hofson on Sheffield Bot. Garden, 126
Hooker, J. D., Report of Kew Herbarium for 1879, 56; for 1880, 381
Holmes, E. M., Chemical tests for Lichens, 115; Hypnum imponens, 116; Kentish Cryptogams, 374
Hong-Kong, a new Melastomacea from, 47; a new Anonacea, 112
Houston's 'Botany for Elementary Schools,' 126
Hudson's specific names, 73
Hybrid Epilobia, 308
Hymenomycetæ of Shropshire, 125
Hyoseris pleiophylla, 60
Hypnum imponens, 116
Hyptis Itatiaiæ, 160

'Icones Plantarum,' 126
Ilicineæ, Stipules in, 94
Indian species of Leea, 100, 135, 163
Indiana Plants, catalogue of, 350
Inoderma, 190
Introduced plants in Chile, 176
Irish Botany, papers on, 19, 167, 189, 233, 338, 345, 351
Irish Mosses, 83; plants, 19, 167

Jackson, B. D., on Botanical Nomenclature, 75, 279; dates of 'Flora Londinensis,' 309; memoir of F. Currey, 310
Jackson's Guide to Botanical Literature (rev.), 180
Jamaica Ferns, 51, 275
Japan, Campanula rotundifolia in, 90
Jenman, G. S., West Indian Ferns, 51; a new Jamaica Tree-fern, 275
Jersey, Plantago arenaria in, 278
Johnson's 'Botany Reading-book,' 285
Johnston, H. H., on Primula scotica, 19
Johnson, W., New British Lichens, 113
Journals, articles in :—
American Naturalist, 30, 60
Ann. des Sciences Nat., 30, 93, 159, 221, 351
Archives des Sciences, 190
Bot. Notiser, 30, 60, 127, 190, 221, 382
Bot. Zeitung, 31, 60, 93, 126, 159, 190, 255, 285, 320, 321, 382
Botanical Gazette, 60, 126, 159, 190, 221, 255, 285, 320, 351, 382
Bull. Soc. Bot. de Belgique, 30, 93
Bull. Soc. Bot. de Géneve, 127
Bull. Torrey Bot. Club, 30, 60, 159, 221, 285, 351, 382
Flora, 31, 60, 93, 159, 190, 255, 286, 320, 351, 382
Hedwigia, 31, 60, 93, 127, 160, 190, 255, 286, 382
Journal of R. Microscopical Soc., 256
Journal of Quekett Club, 160
Linnean Society's Journal, 59, 127, 190, 256, 286, 351
Magyar Novent. Lapok., 31, 60, 93, 127, 191, 286, 351
Midland Naturalist, 127, 160, 221, 320, 351, 382
Naturalist, 30, 60, 93, 256, 286, 320, 351, 382
Nuov. Giorn. Bot. Ital., 60
Œsterr. Bot. Zeitschrift, 30, 60, 94, 127, 160, 191, 221, 256, 286, 320, 352, 382
Popular Science Review, 291
Proceedings of Royal Irish Academy, 189
Revue Bryologique, 31
Science-Gossip, 60, 93, 127
Scottish Naturalist, 60, 93, 191, 285, 382
Juncus rugulosus, 255
Jungermannia Juratzkana in Britain, 116; opacula, 33; Pearsoni, 33

Kent, Rubus spectabilis naturalised in, 251; Cryptogams, 374
Kew Herbarium Report for 1879, 56; Arboretum, 59; Garden report for 1880, 381
Kitchingia, 32
Kuntze, O., on Geysirs (rev.), 27; on Sargassum (rev.), 27; on silicified trees, 175

Lactarius flexuosus in Britain, 352
Lasiopetalum Teppei a hybrid, 350
Lecanora albolutescens, 113; rhagadiza, 113

Lecanopteris Curtisii, 366
Leea, revision of Indian species of, 100, 135, 163; aculeata, 105; acuminata, 102; æquata, 163; alata, 101; angulata, 166; aspera, 136; biserrata, 166; bracteata, 164; Brunoniana, 166; celebica, 166; coccinea, 163; compactiflora, 138; crispa, 135; Cumingii, 166; gigantea, 140; grandifolia, 138; guineensis, 166; herbacea, 137; horrida, 166; integrifolia, 142; javanica, 165; Kurzii, 165; læta, 103; latifolia, 138; linearifolia, 165; macrophylla, 137; manillensis, 166; Mastersii, 142; parallela, 139; pubescens, 167; pumila, 102; robusta, 164; rubra, 104; sambucina, 139; serrulata, 165; setuligera, 105; simplicifolia, 166; sundaica, 167; tinctoria, 167; trifoliata, 102; tuberculosemen, 141; umbraculifera, 141; Wightii, 105; Zippelliana, 166
Lejeunea ulicina, 35
Leontodon hastilis in Devon, 312
Lepidozia Pearsoni, 34
Leptosphæria Plemeliana, 382; pachyascus, 382: variabilis, 286
Lescuræa mutabilis, 114, 174
Lichens, Chemical tests for, 115
Linnæus, a Chinese Puzzle by, 325
Linnean Society, 31, 61, 94, 191, 192, 222
Linum neomexicanum, 159
Literature, Guide to Botanical 192, 222, 383
Lithospermum cobrense, 93; viride, 93
Littorella lacustris in Oxfordshire, 217
'London Pride,' 52
Loranthus nigrans, 209
Luzula albida, 318
Lysimachia Ephemerum, 32

MacOwan, P., appointed to Cape Cape Town Botanic Garden, 64
Madagascar, Natural History of, 327; Ferns from, 366
Malay Islands, Ferns from, 366
Manettia filicaulis, 352
Mathews, W., Ornithogalum tenuifolium in Portugal, 90; Distribution of Alchemilla conjuncta, 91; on Flora of Algeria (rev.), 29
Maximowicz's 'Diagnoses,' 30
Medicago, an introduced, 153
Meetkerke's 'Guests of Flowers,' 29
Megarrhiza Gilensis, 351
Melodorum glaucescens, 112
Melvill, J. C., Rubus spectabilis naturalised in Kent, 251
Mennell, H. T., Plantago arenaria in Jersey, 278
Merceya, 18
Michigan Plants, 284
Micronychia, 126
Miller's (John) drawings acquired by British Museum, 64
Moore, S., on Mr. Darwin's doctrine of Cleistogamy, 84
Morphology of leaf of Fissidens, 98; of Cephalotus, 129 (tt. 219 and 220)
Mosses, Irish, 83
Movements of Plants (rev.), 375
Mueller's 'Eucalyptographia,' 92; 'Fragmenta,' 255, 350
Muhlenberg's Herbarium, 286
Müller's (J.) Characées Génévoises (rev.), 158
Musci Præteriti, 11, 33
Mytilinidion californicum, 221

Nabalus Roanensis, 60
Nephrodium Antioquoianum, 205; longicaule, 204; valdepilosum, 204
New Books, 30, 59, 93, 126, 159, 255, 285, 320, 381
New British Lichens, 113
New Granada Ferns, 202
New Phanerogams published in England in 1880, 117
New Zealand Plants, Thomson on, 125
Newbould, W. W., on authorship of 'English Botany' (ed. iii.), 89
Nicholson (G.), The 'Kew Arboretum,' 59; development of Heat in Phytelephas, 154
Nitella intermedia, 92; megacarpa, 92; opaca, var. attenuata, 356; tenuissima in Cambridgeshire, 278
Nomenclature, recent tendencies in, 75; note on specific names, 279
Norfolk Plants, 278, 357
Northamptonshire, Druce's Flora of, 285
Nuphar lutea, variety of, 279
Nyman's Conspectus, pt. iii., 255

Oaks of Hertfordshire, 152
Obituary:—
J. J. Bigsby, 96
Jacob Boll, 160
Isaac Carroll, 64, 128
F. Currey, 310
J. F. Drège, 160
J. Duncan, 287
M. P. Edgeworth, 288
O. Enerott, 288
R. W. Falconer, 192
D. A. Godron, 127
Ronald C. Gunn, 192
Ernst Hampe, 192, 223
J. M. Hildebrandt, 256
W. L. Lindsay, 64
Frau J. Luders, 96
S. B. Mead, 64
J. C. Niven, 352
A. R. Pryor, 96, 276
G. L. Rabenhorst, 286
Anton Z. Sauter, 192
M. J. Schleiden, 288
H. C. Watson, 256, 257
Alphonso Wood, 26
Oransay, Flora of, 154
Orchideæ, Bentham on, 62
Orchids, list of Garden, 254
Orchis Braunii, 221
Oreopanax Andreanum, 351
Ornithogalum tenuifolium in Portugal, 90
Orr, D., on Irish Mosses, 83
Orobanche Krylowi, 382; Pareysi, 382
Orthosiphon ambiguus, 32, 190
Orthotrichum nivale, 11
Osmunda regalis in Cambridgeshire, 54, 88
Otanthera Fordii, 47
Oxfordshire Roses, 91; plants, 217

Painter, W. H., Flora of Derbyshire, 210, 244, 293, 374
Palicourea brasiliensis, 160
Pearson, W. H., Jungermannia Juratzkana in Britain, 116
Pedicularis eximia, 190
Pelagophycus, 190
Peloria in Delphinium, 352
Pentstemon pauciflorus, 255; pinifolius, 255
Pertusaria spilomanthoides, 113
Peziza bulbocrinita, 286
Phacelia cœrulea, 382
Phanerogams, New, published in 1880, 117
Phaseolus parvulus, 255
Phillips, W., on Shropshire Hymenomycetæ, 125; Botrychium Lunaria in Shropshire, 217
Philodendron, development of heat in, 154
Phyteuma confusum, 286
Pitcairnia, synopsis of, 225, 266, 303; albiflos, 270; albucæfolia, 265; alta, 266; Altensteinii, 306; Andreana, 270; angustifolia, 232; aphelandræflora, 304; araneosa, 231; atrorubens, 307; australis, 272; bracteata, 266; bromeliæfolia, 267; caricifolia, 232; cinnabarina, 268; concolor, 269; consimilis, 266; corallina, 272; corcovadensis, 268; densiflora, 307; echinata, 272; ferruginea, 304; firma, 268; flammea, 271; fulgens, 270; Funkiana, 305; furfuracea, 265; heterophylla, 228; humilis, 231; imbricata, 307; inermis, 229; integrifolia, 230; iridifolia, 232; Jacksoni, 267; Kalbreyeri, 273; Karewinskiana, 268; Kegeliana, 230; latifolia, 232; Lechleri, 269; Lehmanni, 273: maidifolia, 305; megasepala, 229; microcalyx, 228; Moritziana, 231; muscosa, 231; nubigena, 273; nuda, 269; ochroleuca, 306; Olfersii, 271; orgyalis, 273; pauciflora, 230; penduliflora, 303; pruinosa, 270; pulverulenta, 271; pungens, 230; punicea, 304; recurvata, 305: rhodostachys, 306; spathacea, 269; Sprucei, 303; staminea, 229; suaveolens, 269; subpetiolata, 267; tabulæformis, 228; undulata, 303; vallisoletana, 303; virescens, 304; Wendlandi, 306; xanthocalyx, 272; zeifolia, 305
Plantago arenaria in Jersey, 278
Plant names, American, 351
Plerandra jatrophifolia, 275
Polemonium flavum, 255
Polygala Wattersii, 209; uliginosa in Teesdale, 251
Polygonum Parryi, 351
Polypodium Antioquoianum, 205; Curtisii, 367; sylvicolum, 205
Polyporus lactifluus, 221
Portugal, Ornithogalum tenuifolium in, 90
Portulaca suffrutescens, 285
Potamogeton lanceolatus, 9, 54, 65 (tab. 217); notes on various

species, 241; Irish species, 312; heterophyllus *var.* pseudonitens, 344; Hillii, 382
Potentilla subviscosa, 351
Primula Rusbyi, 382; scotica, flowering of, 24
Pryor, R. A., memoir of, 276; notes on Abbot's Herbarium, 40, 67; Osmunda regalis in Cambridgeshire, 54; Eryngium campestre in Suffolk, 55; the Dunwich Rose, 56; Hertfordshire Oaks, 152; seeds introduced with wool, 153; dates of Curtis's Flora Londinensis, 309
Psychotria chontalensis, 188; cyanococca, 188
Pteris appendiculata, 366; phanerophlebia, 367; sumatrana, 367
Puzzle, a Chinese, by Linnæus, 325
Pyrus latifolia in E. Cornwall, 345

Radnorshire Plants, 170
Radula Carringtonii, 351
Ranunculus Baurii, 32, 190; hirsutus, synonymy of, 45; pangiensis, 32, 190; sardous, 45
Reviews:—
Reports of Botanical Record Club, 25
Species, Genera, et Ordines algarum. By J. G. Agardh, 26
Ueber Geysirs. By O. Kuntze, 27
Revision von Sargassum. By O. Kuntze, 27
Familiar Garden Flowers. By F. E. Hulme and S. Hibberd, 58
Characeæ of America. By T. F. Allin, 92
Les Characées Génevoises. By Dr. J. Müller, 158
Guide to the Literature of Botany. By B. D. Jackson, 180
Botany of California. By S. Watson (vol. ii.), 185
Flora of British India. By Sir J. Hooker (part viii.), 85
Biologia Centrali-Americana (Botany). By W. B. Hemsley (part vii), 188
Peruvian Bark. By C. R. Markham, 218
Rabenhorst's Kryptogamen-Flora. Von Dr. G. Winter, 220
Manual of British Botany. By C. C. Babington, 280
Quelques Mots sur l'étude des fruits. Par Paul Brousse, 317
Botany for High Schools and Colleges. By C. E. Bessey, 349
The Movements of Plants. By Charles Darwin, 375
Rhamnus carniolica, 286
Rhodocodon, 32
Rhododendron Henryi, 243
Rhytiglossa indica, 352
Ribes Mogollonicum, 382; pinetorum, 93
Ridley, H. N., Carex pilulifera *var.* Leesii (tab. 218), 97, 151; on Radnorshire plants, 170
Ridley's (Miss) 'Pocket Guide to Ferns,' 350
Robinson's 'Wild Garden,' 319
Roper, F. C. S., Notes on the Flora of Sussex, 369
Rosa Carionii, 30; Lucandiana, 30; sepium in Ireland, 345; tomentosa *var.* Woodsiana, 315
Rose, the Dunwich, 56; Roses of Devonshire, 30; of Oxfordshire, 91
Rubus canadensis, 326; spectabilis naturalised in Kent, 251
Rudbeckia laciniata, 116; rupestris, 159
Ruellia Saltpoorensis, 352
Ruppia rostellata *var.* nana, 346
Russula cinnamomea, 93; variata, 93

Salacia parviflora, 351: rugulosa, 351
Salix glaucophylla, 284; Heimerli, 191
Salvia prætermissa, 116
Sargassum, Kuntze on (rev.), 27
Sarothamnus commutatus, 191
Saussurea americana, 382
Saxifraga fragarioides, 382
Scapania Biroliana, 60
Schistophyllum Orrii, 31, 83
Schizocapsa plantaginea, 292
Sciadophyllum Planchonianum, 351
'Science-Gossip' Bot. Exchange Club, 159
Scirpus maritimus in Berks, 55; pauciflorus in Berks, 251
Scopelophila Agoyanensis, 12; cataractæ, 15
Scorpioid Cyme, history of the, 3
Scutellaria mussooriensis, 160

Selaginella alopecuroides, 368; longissima, 208
Senecio canadensis, 326; Cardamine, 351; Howellii, 351; phalacrocarpus, 150; trullæfolius (*errore* hullæfolius), 190
Seseli Malyi, 127
Sheffield Botanic Garden, 126
Shropshire Plants, 48, 106, 143, 217; Hymenomycetæ, 125
Silene Schlosseri, 60
Silicified Trees, 176
Singapore, new Dracæna from, 326
Smith and Wheeler's Catalogue of Michigan Plants, 284
Solidago Noveboracensis, 326
Somersetshire, Thlaspi alpestre in, 174
Sophora viciifolia, 209
Spartina Townsendi, 347
Specific Names, note on, 279
Sphærella intermixta, 382
Sphæria consociata, 221
Sphagnum subbicolor, 116
Sphenophyllum myriophyllum, 93
Sphenopteris Sauvèurii, 93
Sporodesmium Ranii, 221
Spring Flowers, colours of, 313
Spruce, R., Musci Præteriti, 11, 33; Morphology of leaf of Fissidens, 98
Sphæronema capillare, 221
Stachys Spreitzenhoferi, 30
Stipules in Ilicineæ, 94
Strossmayeria, 382
Suffolk, Eryngium campestre in, 55
Surrey plants, 279
Swainsonia Murrayana, 160
Synchitrium Jonesii, 285

Taccaceæ, H. F. Hance on, 289
Talinum confertiflorum, 382; humile, 159
Tate on Australian Plants, 125
Teesdale plants, 251
Thlaspi alpestre in Somersetshire, 174
Thomson's Central African plants, 178
Thomson on N. Zealand plants, 125
Timmia austriaca, 115
Townsend, F., on Erythræa capitata, 87, 302; on Carex flava, 161; notes on Report of Bot. Exchange Club for 1879, 175; on Festuca oraria, 242
Tradescantia tuberosa, 159
Trichomanes Kalbreyeri, 203; setiferum, 52
Trichostemma Parishii, 126
Trichostomum Maynense, 16
Trimen, H., Cinchona Ledgeriana a distinct species (tt. 222, 223), 321
Tsuga caroliniana, 255
Tulipa sylvestris in flower, 175

Ulmus, British species of, 42
Ullyett's 'Rambles round Folkestone,' 29
Urginea alooides (*errore* alvoides). 190
Uromyces psoraleæ, 285; zygadeni, 285
Urtica gracilenta, 382
Ustilago cingens, 382

Varenne, E. G., on Brassica Briggsii, 360
Veitch's 'Manual of Coniferæ,' 320
Verrucaria interseptula in Cumberland, 382
Vicia leucophæa, 255
Vines, S. H., History of the Scorpioid Cyme, 3
Viola arenaria in Teesdale, 251; lactea in Bucks, 251
Viscum terrestre, 326

Wales, N., Desmideæ of, 127
Ward on Coffee-leaf disease, 125
Warner's mosses and lichens, 160
Warwickshire Flora, 126
Watson, H. C., on authorship of 'English Botany,' ed. iii. 89; memoir of, 257
Weinmannia Itatiaiæ, 352
Weisia agoyanensis, 12; cataractæ, 15
West Indian Ferns, 51
West, W., Bryological Notes, 114, 174
Wexford plants, 338
Wheeler and Smith's Catalogue of Michigan Plants, 284
White, J. W., Rudbeckia laciniata, 116; spring-flowering form of Colchicum autumnale, 175
Wise, W., on Cornwall plants, 55, 217
Wolffia arrhiza in Ceylon, 223
Woolhope Club, Fungus Foray of, 352

Yorkshire, a Carex from, 24
Yucca macrocarpa, 255

Zannichellia macrostemon, 251
Zygadenus porrifolius, 382

ERRATA ET CORRIGENDA.

Page 1 line 8 from bottom, *for* "*N.*," *read* "*Nitella.*"
30 20 from top, *for* "Panchon," *read* "Pauchon."
46 5 from bottom, *for* "generally," *read* "generically."
83 5 „ *for* "*viridulis*," *read* "*viridulus.*"
„ 23 „ *for* "*Orri*," *read* "*Orrii.*"
107 15 „ *for* "Rerrington," *read* "Berrington."
109 lines 21 and 22 from top, *dele* "and."
114 line 24 from top, *for* "edition," *read* "addition."
123 6 „ *for* "*Parsea*," *read* "*Persea.*"
124 1 (top), *for* "*Rubus*," *read* "*Rosa.*"
„ 2 from top, *for* "Id.," *read* "Journ. Bot."
126 18 from bottom, *for* "Dr.," *read* "D."
190 1 (bottom), *for* "*alvoides*," *read* "*alooides*," and *dele* , after *Dipcadi.*
„ 3 from bottom, *for* "*hullæfolius*," *read* "*trullæfolius.*"
„ 7 „ *for* "*puncronifolia*," *read* "*mucronifolia.*"
224 4 from top, *for* "Lactenus," *read* "hactenus."
242 12 „ *for* "1881," *read* "1879."
255 18 from bottom, *for* "Arizora," *read* "Arizona."
284 2 from top, *for* "*peleginæ*," *read* "*pelegina.*"
„ 21 „ *for* "Thev.," *read* "Thw."
282 16 „ should precede line 14.
283 16 from bottom, *for* "*macrocarpa*," *read* "*odorata.*"
310 3. The MS. note of Pulteney, here referred to, will be found in his copy of Hudson's 'Flora Anglica,' ed. i., now in the library of the Linnean Society.—See p. 45, foot-note.
320 13 from bottom, *for* "Etna," *read* "the Nebrodes."
329 10 from top, *for* "10°," *read* "1°."
336 20 from bottom, *for* "*Baukea*," *read* "*Bankea.*"
337 13 from top, *for* "*Mucaceæ*," *read* "*Musaceæ*," and *for* "*Ravenalia*," *read* "*Ravenala.*"
351 9 from bottom, *for* "Reproductive," *read* "Reparative."
352 3 from top, *for* "*Cystanthera*," *read* "*Cyrtanthera.*"